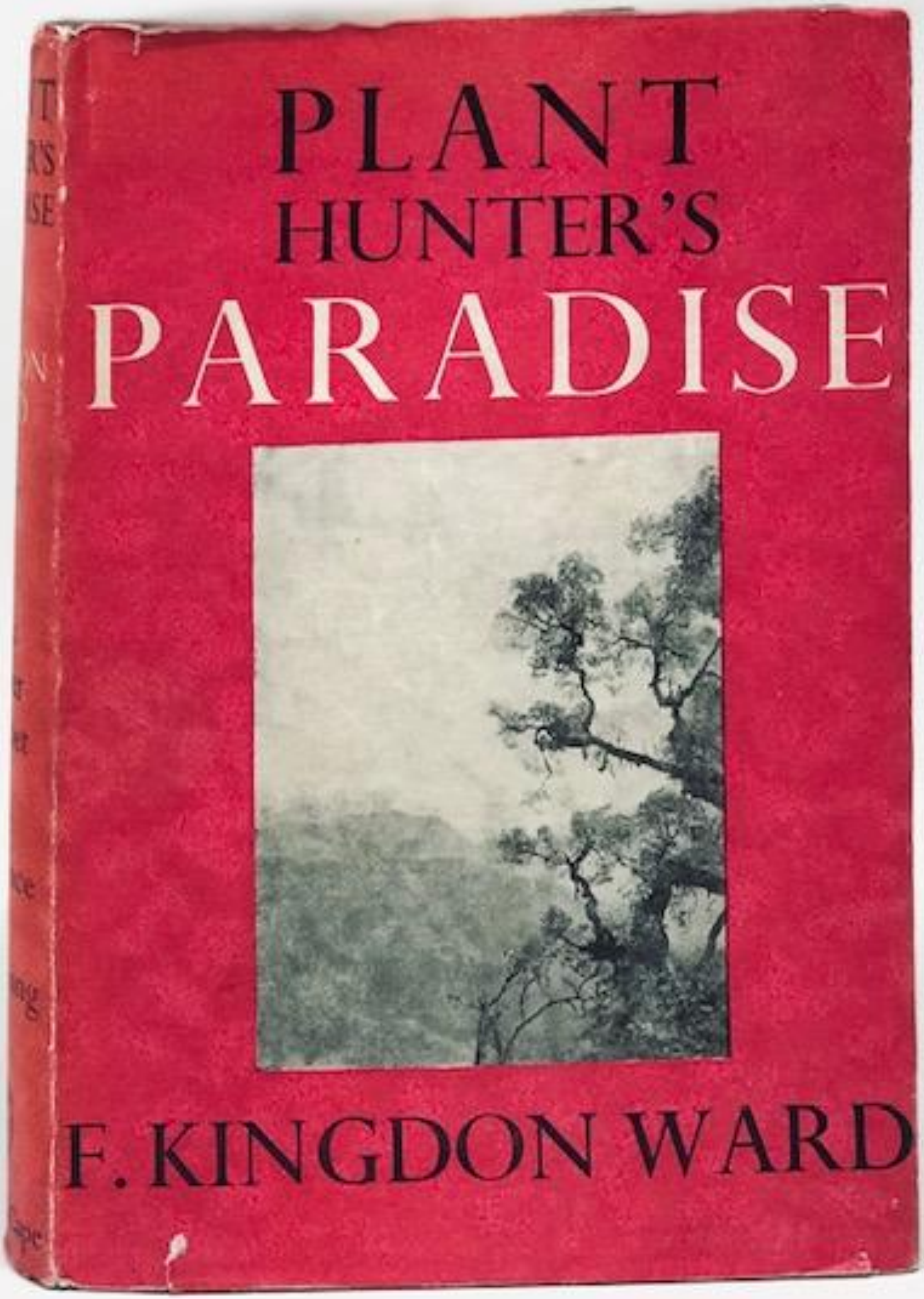

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F. KINGDON WARD

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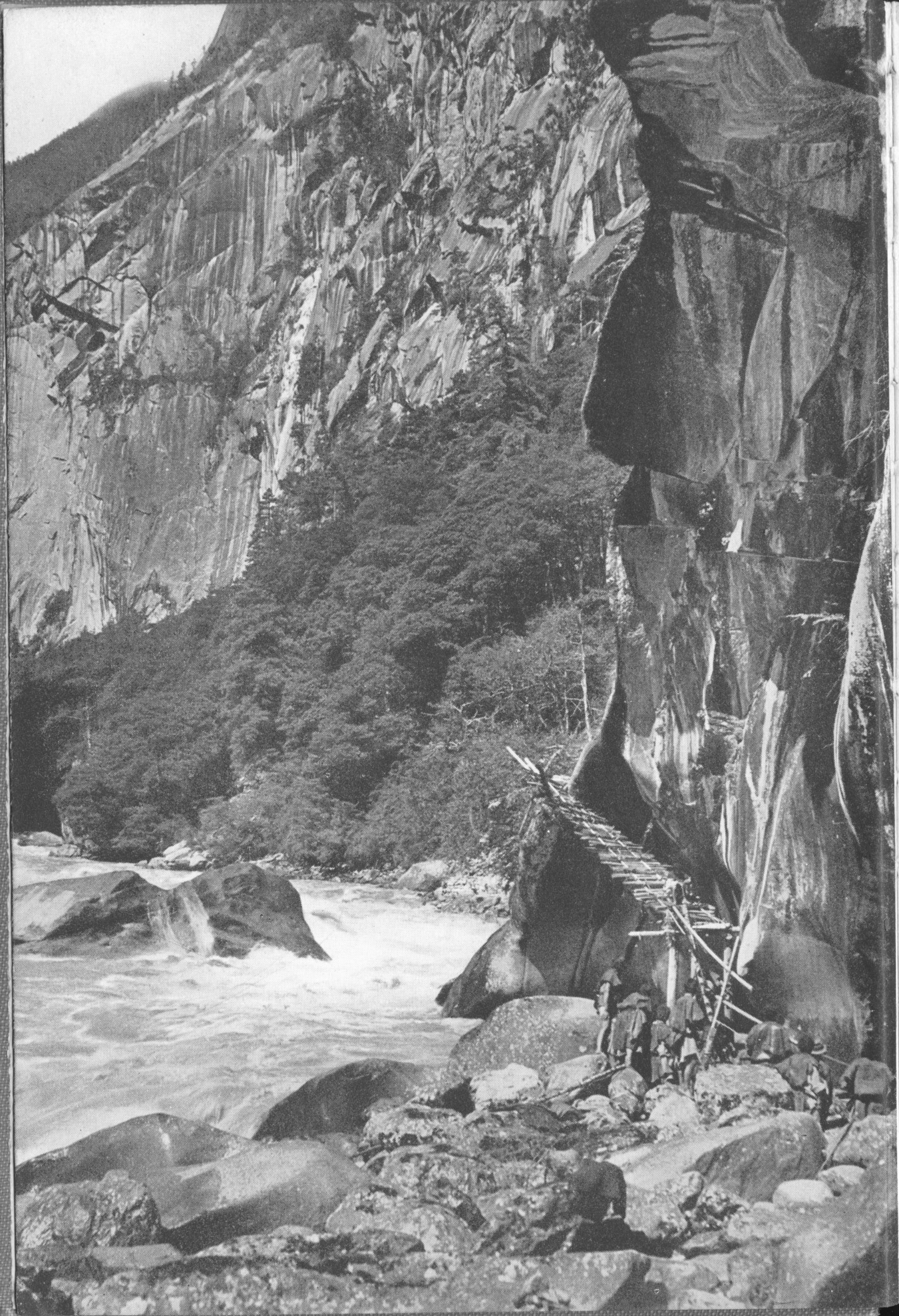

PLANT HUNTER'S PARADISE

by

F. KINGDON WARD B.A. (Cantab.)

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JONATHAN CAPE
THIRTY BEDFORD SQUARE
LONDON

[*facing:* BRIDGE-BUILDING IN THE GORGE OF
PO-YIGRONG, 10,000 FEET

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CONTENTS

	PREFACE	11
I	THE ROAD TO MYITKYINA	17
II	GOOD-BYE TO CIVILIZATION	27
III	WHERE BURMA ENDS	38
IV	TRIALS OF THE MODERN EXPLORER	51
V	WE RECEIVE AN OMINOUS LETTER	65
VI	NATIVE CUSTOMS OF THE DARUS	78
VII	LAND OF THE RHODODENDRON	90
VIII	THE LAST VILLAGE IN BURMA	99
IX	A BIRD PARADISE	116
X	MAINLY FOR BOTANISTS	131
XI	SPRING COMES TO THE ADUNG VALLEY	144
XII	THE RACKETEER PLANT HUNTERS	157
XIII	WE SET UP AS DOCTORS	169
XIV	AN EXASPERATING CLIMB	182
XV	THE ROAD TO TIBET	192
XVI	AN ENCOUNTER WITH A CAT-BEAR	206
XVII	THE EAST HANGING VALLEY	217
XVIII	MANO GOES DOWN WITH FEVER	229
XIX	A BAND OF DESPERADOES	243
XX	A DEAL WITH FAN LI	257
XXI	TIBET PROVES UNFRIENDLY	267
XXII	THE MYSTERY OF THE IRRAWADDY	285
XXIII	A PRIZE FOR ENGLISH GARDENERS	303
XXIV	JOURNEY'S END	317
	APPENDIX I	331
	APPENDIX II	333
	APPENDIX III	337
	APPENDIX IV	343

ILLUSTRATIONS

BRIDGE-BUILDING IN THE GORGE OF THE PO-YIGRONG, 10,000 FEET *Frontispiece*
A DARU HUNTER *facing p.* 74
A ROPE BRIDGE OVER THE ADUNG RIVER 88
DARU GIRLS 114
RHODODENDRONS IN THE ADUNG VALLEY 122
RHEUM NOBILE FLOWERING AT 16,000 FEET, TIBET 132
A NEW GENUS OF *CRUCIFERAE* AT 16,000 FEET, DRY CLIFFS, SOUTHERN TIBET 132
A TIBETAN MATRON 152
RHODODENDRON NUTTALLII BY THE ADUNG RIVER 194
LOOKING UP THE VALLEY TOWARDS NAMNI LA FROM LUNG SA CAMP 226
LOOKING NORTHWARDS UP THE NAM TAMAI 258
TIBETANS PLOUGHING WITH YAK, IN THE ADUNG VALLEY 280
THE LAMA OF TAHAWNDAM 300

MAPS

NORTHERN BURMA AND ADJACENT REGIONS 17
FAR NORTHERN BURMA AND THE SOURCES OF THE IRRAWADDY 328

PREFACE

My thanks are due to those who helped us on our way, and to those who have patiently raised and cultivated the plants we brought back. Particularly would I mention Mr. Charles Snydam Cutting, to whom the book is dedicated, and with whom I travelled in Assam for some weeks in 1927; Capt. J. Ramsbottom, O.B.E., Keeper of the Botanical Department, Natural History Museum; and in Burma, Sir Joseph Maung Gyi, then Acting Governor of Burma, Colonel and Mrs. Thyne, of the Burma Military Police, and Mr. Leedham, Assistant Superintendent, Fort Hertz. For what we did, and left undone, the book, perhaps, speaks for itself.

F. K. W.

Cleeve Court
Streatley
Berkshire, 1937

To my friend

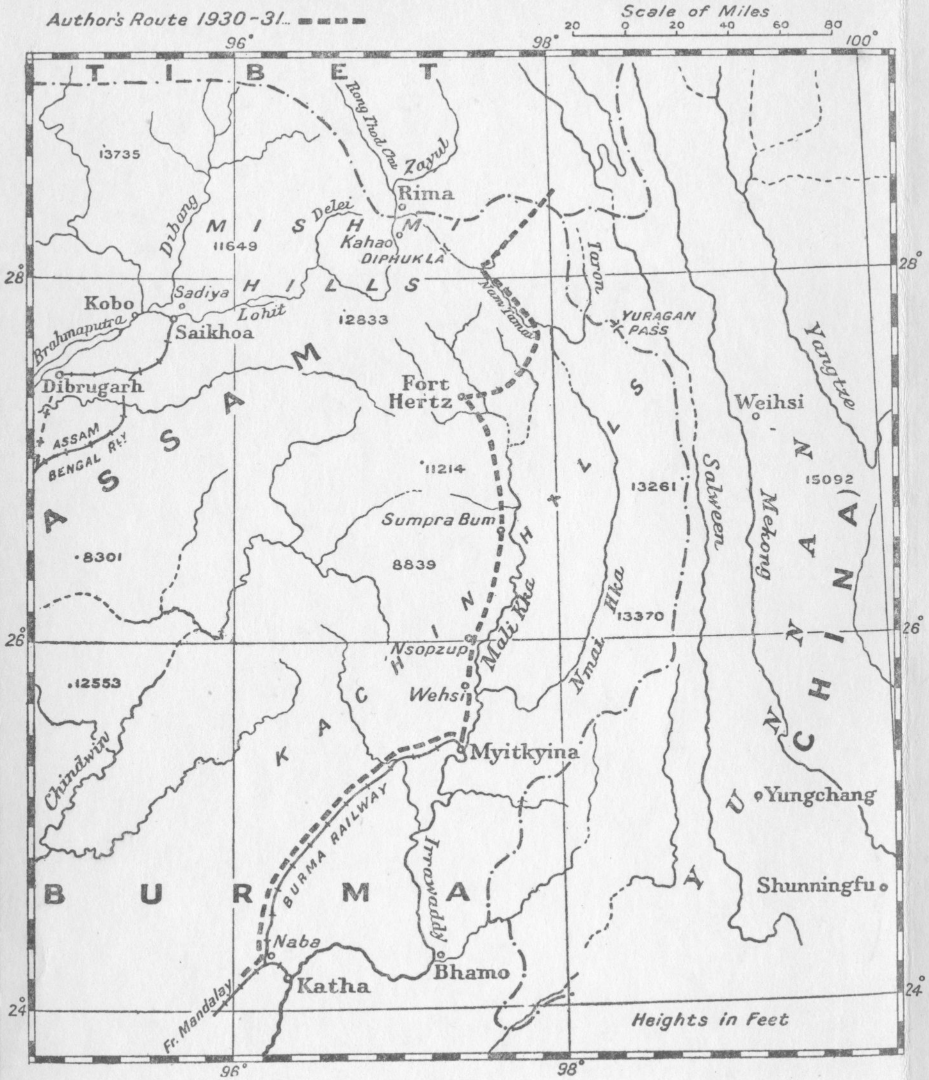
CHARLES SNYDAM CUTTING

New York

gratefully

PLANT HUNTER'S PARADISE

NORTHERN BURMA AND ADJACENT REGIONS.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Myitkyina
Yungchang
BURMA RAILWAY
Irrawaddy
BURMA
Shunningfu
Naba
Katha
Bhamo
Fr. Mandalay
Heights in Feet

CHAPTER I

THE ROAD TO MYITKYINA

It was the middle of November. I was awakened at dawn by the anchor chain running out through the hawsehole. The engines had ceased to throb; and the silence was strange. Looking out of the porthole, near the coast of Burma, I saw turbid water slapping against the ship's plates. 'No sea-water bath this morning, sir,' said the steward. He placed my tea on a camp stool and smirked. He was a north countryman, very lean, and disliked the tropics.

I had a sponge-down with the meagre ration of fresh water, dressed quickly and went up on deck, just as the breakfast bugle sounded down the alleyway. It was sticky and hot, in spite of a breeze which set the lustreless yellow water dancing. The liner was riding at anchor, motionless. The quartermaster, a black-haired, blue-eyed Cornishman, was hauling down a line of bunting, signal for a pilot and other things. A yellow quarantine flag drooped from the masthead. In the offing a small lightship rocked rhythmically. Far away on the horizon a faint line, just discernible, might have been land; but it might equally well have been a cloud.

I watched a flimsy rowing boat, skilfully handled, put off from the lightship and cross the water between us. Presently it was alongside, bobbing up and down. A spruce, sailorly man with crisp, fair hair, blue eyes and a very red face, reddened equally by tropical sunshine, salt sea breezes and whisky, climbed without hurry up the rope ladder which hung over the ship's side and stepped on deck. We had taken the pilot on board.

The Man from Burma joined me for a stroll before breakfast. He had been celebrating the announcement of our desertion of the Gold Standard and sounded tired. 'We have to wait for the tide,' said he. 'Not enough water on the bar.' Nevertheless we had not long to wait.

The sight of that thick, heaving yellow water excited me. Here, twenty miles out at sea, before we had made a landfall, was the Irrawaddy mud: mud brought down from the highlands of Asia, more than a thousand miles away. We were in the Bay of Bengal, off the hundred mouths of the Irrawaddy, approaching the delta of one of the great rivers of the world. Irrawaddy! The name alone! What it conveyed! My thoughts flew back to earlier efforts to trace one of its great headwater streams to the source: efforts which owing to fever had failed. And here I was ready to try again. Only this time I meant to succeed.

'I've been up the Irrawaddy all the way to Mandalay by steamer,' broke in the Man from Burma, 'and believe me, you won't see any flying fish. If there ever were any, they've all been made into *ngapee* by now; you can smell *that* from Bassein to the Hastings.'

I agreed, without committing myself in the matter of flying fish. As a matter of fact I was thinking, not of flying fish, but of dolphins, wondering why the Irrawaddy dolphin (*Orcella fluminalis*) should be so entirely different from the near Brahmaputra dolphin (*Plantanista gangetica*) that the two are placed by zoologists in different families, though both rivers flow into the Bay of Bengal and their mouths are within 600 miles of one another. At one point the Brahmaputra and Irrawaddy flow within 250 miles of one another — while the Chindwin, a big tributary of the latter, where also the Irrawaddy dolphin is found, actually flows within a hundred miles of the Brahmaputra. All three rivers are separated by ranges of high hills, it is true. But this is one of the still unsolved problems of geography. The facts only indicate the long separation of these rivers and their earlier connection with entirely different systems.

'Talking of Kipling,' the Man from Burma again broke in, 'you can't look eastwards to the sea from Moulmein, you know; it would have to be westwards. And China isn't "cross the Bay". But of course Kipling was never in Burma'.

'Would that matter very much?' I ventured. 'He might have read about it, and anyhow poetry is — well, poetry.'

'But you see the result,' said the Man from Burma, shrugging his shoulders. 'His geography's pitiful.'

'Don't you think perhaps he *meant* his old soldier to get a bit mixed up? After all, he was a Tommy, and it happened a long time ago when soldiers learnt about fighting and marching and not much else.'

But the Man from Burma wasn't listening, so I went down to breakfast. When I returned on deck, we were under way again, and the coast showed up clearly, marked by palm trees. They looked like toys, but quivered in the heat. Presently the ship was gliding between mud banks; pilot signals appeared, then villages of grass huts. We were in the Rangoon river.

The heat grew fiercer. People crowded on deck. The Man from Burma, with a rapt look on his wet and cheerful face, was pointing out the sights to some friends. We were moving past ships of all nations, wharves, oil tanks, native craft, godowns. Suddenly we were quiet. Everyone crowded forward and stared into the brazen sky, where a long, lean pillar flashed back the sunlight like a thin golden flame. It was the Shwe Dagon, the most famous and beautiful shrine in the Buddhist world. For a moment we were silent at the sight; nobody spoke until an American tourist said in a high-pitched voice: 'Say, now, isn't that just the swellest Statoo of Liberty!' That ended the moment.

An hour later we were alongside the wharf, where friends had gathered to greet friends. My travelling companion, Lord Cranbrook, and I had been invited to stay at Government House. At this time Sir Charles Innes was Governor of Burma, but he had been called home to confer with the heads of the India Office, and Sir Joseph Maung Gyi, a Burman, was acting in his stead. So we became the guests of Sir Joseph.

A gaudy A.D.C. came on board and greeted us with ponderous gaiety. He threw admiring glances at the two girls, to whom I introduced him, and immediately invited them both to come up to Government House for cocktails and a swim in the new swimming-pool that evening. These two girls, Boo and Betty, friends of mine, did a great deal of entertaining by the sea every summer, and used to invite me down for week-ends. From the first

they had been interested in my expedition to Burma. Now they had decided to come with us as far as the railhead and see us off on our year's travels in the jungle. Cranbrook had gone before me to the East and joined the ship at Colombo.

Boo was a dark and handsome Welsh girl with all the spirit of her native hills in her moods. Betty, in contrast, was a modern young English blonde.

We said good-bye to them here — they were due to stay with an aunt in Rangoon for a few days — and were driven out of the heat and dust and racket of the docks, through the town and across the maidan into the shady roads of Cantonments. How correct everything was! Trim bungalows standing back from the road, half-hidden amongst trees, smart motor cars bringing carefully-dressed officials (Harrow and Trinity) home from 'office'; other cars taking smart ladies out for a drive; spick and span native ayahs taking the children out for a walk. It was pure Kipling, Simla in little. These government officials do their twenty-one years' service — not necessarily work — and then retire in comfort to Cheltenham and visit London once a week, eat curry at the Oriental club and write letters to the *Morning Post*. That is their life. I preferred my own.

So we came to Government House. Passing through the great iron gates, where the Gurkha guard in khaki shorts and slouch hats turned out and presented arms, the car accelerated up the drive and halted before a broad flight of steps. Tall Bengal Lancers standing sentry, magnificent in scarlet coats, white breeches, blue and gold pugarees, and top boots, part of the

Governor's body-guard, saluted as we passed up the steps into the cool spaciousness of Government House.

A few minutes later we were being warmly welcomed by Sir Joseph Maung Gyi, Acting Governor of Burma, then the largest province of the British Indian Empire.

Our days in Rangoon passed swiftly and pleasantly. I remember a dinner party at Government House. We sat in the reception hall afterwards in the warm dusk, listening to the gramophone. There was a medley of old popular songs, Victorian songs written in the living language of the people and set to infectious melody, not the incoherent noises blurted from those convoluted instruments to which modern youths croon and posture! How we roared out 'Daisy! Daisy!' and 'Monte Car-lo!' And Sir Joseph, grey-haired Burmese gentleman with deeply lined strong face and kindly eyes, on hearing that fine marching song 'Tommy Atkins', cocked his head on one side and said reminiscently: 'I haven't heard that since I was home last in 'ninety-nine.'

'Home!' To this Burman Governor England was home. The remark made me oddly happy. Sir Joseph Maung was an independent spirit. The Burmese rebellion broke out a month later. A hesitating governor fearful of bloodshed would have ordered out extra police and lost valuable time in useless attempts at conciliation, blind to the fact that he was dealing with *fanatics*. But Maung Gyi's decision was swift and uncompromising. He called out the military, decreed martial law in the district affected and had the rebellion well in hand from the start. That it dragged on for nine months was no

fault of his. He had isolated it and prevented it from spreading all over Burma.

On November 19th we left Rangoon for Mandalay. Boo and Betty joined us at the station, and friends and reporters came to see us off. At that moment my embarrassments began. Outside Rangoon there is not an hotel in Burma. There are Circuit Houses and dâk bungalows, but I had forgotten that Circuit Houses were for officials travelling on duty and that dâk bungalows at this season would be full. Unless he has friends who will take him in, the rare sightseer who ventures north of Mandalay had better arrange to sleep on the train or the river steamer, or else to camp. Cranbrook and I were bound for Myitkyina (pronounced Mitchina), a thousand miles up the Irrawaddy, at the northern terminus of the Burma Railway, 720 miles from Rangoon by rail. Friends would entertain us at Myitkyina while we were making our final preparations before disappearing into the wild country for a year. They could hardly be expected or asked to put up two strange young ladies; they would have no room. However, I must try. I would get them into the Circuit House somehow, by 'influence' if necessary. I telegraphed my host, who was Commandant of the Military Police battalion in Myitkyina, asking him to arrange quarters for Boo and Betty; and went to sleep with an easy mind.

All night we travelled north, and in the morning came to Mandalay, where we broke our journey for a day. Here we were joined by two round-faced, slant-eyed sepoys of the Burma Military Police who were returning to their village in the mountains beyond Fort Hertz.

They looked very smart in the khaki shorts and tunics with sidearms. They belonged to the Hkanung tribe and had been recruited for service with the semi-military body which keeps order along the thousand miles of Burma's eastern frontier. After three years' service they were now due for their first leave. In return for a mule to carry their kit and twenty rupees each, they would act as interpreters and orderlies for as long as our roads lay together. Our common tongue was Hindustani, which they had had to learn while with the police; they also spoke a little Chingpaw, and of course their native Hkanung, They would be valuable to us.

We spent a night in Mandalay, dined with the Commissioner, visited the late King Theebaw's palace — a carved, wooden building with a tapering spire, as garish inside as a Lyons' Corner House, within the moated wall of royal Mandalay, and left next day for Myitkyina. After another night in the train we arrived early next morning at Naba junction, where a telegram was handed to me by the station-master. It was from my host-to-be and informed me briefly that there was positively no accommodation in Myitkyina for my women friends. In face of that categorical refusal I had to act quickly. I had to bundle the two hapless young ladies out on the platform, bag and baggage, and send a wire to a misogynist friend in Katha, on the Irrawaddy, saying that they were arriving by the next train, and would he please do something. The train for Katha, twenty miles distant, was about to leave, and we parted from our pleasant travelling-companions on the cold wet platform of the junction in the half-light of dawn. The sky drizzled

spitefully. I promised to send them a wire from Myitkyina as soon as I could arrange suitable quarters.

'You *will* ask us up to Myitkyina, won't you, K.W.?' were Boo's last words to me; and I swore we would not leave Myitkyina till they arrived. Our train steamed out of Naba, leaving the young women on the platform waving forlorn handkerchiefs. It depressed me. I should miss Boo's infectious laughter. A few minutes later their train left for Katha, and I learnt afterwards that they were welcomed and royally entertained by the several inhabitants of the little riverside town whence the steamers ply to Bhamo, near the China frontier.

The day passed slowly. Across the wide plain the frontier hills began to appear; and as they rose along the sky-line, so too did my spirits rise. In the late afternoon we reached Myitkyina, the terminus of the railway, and the little train discharged its crowd of motley passengers. Friends were there to welcome us. It took us some time to get all our boxes, tents, and other gear stowed on to bullock carts; but at last we were free to accompany our host to his bungalow on the high bank of the Irrawaddy.

At the Gymkhana Club we met the entire white population — half a dozen officials and their wives. It is a small isolated community at the end of the railway line, seven hundred and twenty miles from Rangoon, reached by train on the third day. In the cold weather, polo, tennis, fishing, shooting and picnicking engage their leisure hours; but during the five rainy months, when Myitkyina becomes a hot, steamy swamp, and tempers are strained by monotony and close confinement, there is nothing to do but play bridge and gossip. The rainy season was just over, and ours were the first fresh faces the bored inhabitants had seen for months. They welcomed us warmly and took a lively interest in our expedition. Beadon, the District Superintendent of Police, spoke for them all when he said: 'I wish I were coming with you. I've looked at the hills from this side every day for two years until I know them as well as you know Ludgate Hill, but I've never seen what lies just beyond. Lucky devils!'

The rain had stopped after four days of storm, and the mountains were sharply defined against the starry sky. The moon, rising over the China frontier, set a gash of silver across the face of the Irrawaddy. I looked out of my window on to the dark massive trees, the hedges of hibiscus and poinsettia and over the grassy plain which the river seems annually about to engulf. I was a thousand miles on my way to the glaciers which feed the Irrawaddy. The first part of our journey was over. Henceforward there would be a slackening of the pace.

My plan took shape. We would seek the source of the Tamai river, the largest tributary of the eastern branch of the Irrawaddy. The eastern branch, known just above Myitkyina as the 'Nmai Hka', is made up of the Taron (main stream) and the Tamai, besides smaller tributaries. When we had reached the source of the Tamai, we would seek a pass into Tibet and discover the source of the Taron itself. It was uncertain which of several rivers was the source of the Taron.

CHAPTER II

GOOD-BYE TO CIVILIZATION

When my hostess offered to put up the girls if they would share a room, I assured her that they would be only too grateful for any accommodation in Myitkyina. I was now completely happy. That morning I received a slanderous wire from my misogynous friend in Katha which said: 'Your harem arrived safely stop what do you want done.' I wired back to the girls to come on by the next train, and the same evening to my joy the four of us were reunited in Myitkyina.

The next few days were not idle ones. I was anxious to start and pushed on with our preparations, for there were many things to be attended to before we launched ourselves into the sea of hills. Most important item, I had to engage a cook, also to hire transport for eighteen days' march to Fort Hertz.

Should I take an Indian Mug or a Burmese to cook? The Mug would be the better cook without a doubt, but he would also be more of a foreigner. Burmese servants, on the other hand, are horribly superior persons. I once had a Burmese 'boy' who, on a night when I had friends to dinner, was wired for by his sister. He started at once, before we returned from the Club. It seemed she was dying. After dinner we went to see a native dance in the neighbourhood. The first person I saw in the crowd was my 'boy' strutting about to the admiration of all the village maidens and the envy of the men; for with him was an extremely pretty girl, not, I gathered, his sister, who by this time was dead. He was cutting a figure in my best Trilby and twirling a silver-mounted rhinoceros-hide walking-stick, also my property. Walking up to me, quite unabashed, he said with a low bow: 'Your hat and stick, sir! I thought you might want them!'

It was not so easy to find a cook in a village like Myitkyina. Every native cook in Burma has a friend or relative looking for a job; and as all government officials living on the frontier tour round during the cold weather, anybody signing on as cook knows what to expect. Service with Cranbrook and me, however, was a rather different proposition. We were about to tour, not for a month, but for a year. All the comforts would fall away. From the time we left Fort Hertz to the time we returned, we should be sleeping in tents or in native huts or, if need be, under the stars. Nor were we touring merely in the 'open' season when the jungle tracks and dirt roads are passable: that is, in the cold and usually dry weather between November and May. We must be out all through the rains, too, a season when most people stay at home.

Not only is there the discomfort of the heavy rainfall itself but also during the warm summer months everything grows prodigiously, and noxious life is twice as powerful. The deadliest guardians of the Burmese jungle are not tigers and Russell's vipers, deadly as they are, but battalions of leeches, blister flies, ticks, mosquitoes, sand-flies and horse-flies, all avid bloodsuckers, whose bites cause fevers, festering sores and a crazing irritation.

Consequently even the unemployed were a bit shy of us.

However, a young Burman named Ba Kai, ambitious to travel, was found willing to go, and although I had scruples on account of his youth he stayed with us throughout the journey, acquitting himself most creditably. Unfortunately he knew no Hindustani, and as I spoke very little Burmese we were occasionally at cross-purposes. It was easier for Ba Kai to learn Hindustani than it was for me to learn Burmese.

The transport problem was more easily solved. Chinese contractors supply Yunnan mules and drivers by the hundred to the local Government during the open season, for work on the frontier. So I called on my old friend Fan Li San, the government mule contractor, who had made a fortune gambling in jade (quarried and sold on the spot in large angular lumps which reveal no hint of their value until cut open) and smuggling opium into Burma concealed in hollow wooden mule-saddles. From him I hired thirty mules for the journey to Fort Hertz. Beyond that point a Gilbertian agreement between the Burma Government and the Yunnan clique forbade Chinese muleteers to work. There is a quite passable mule road from Fort Hertz to the Tamai river, but the agreement stipulates that Chinese mules shall not be employed east of the Mali Hka — that is, the western branch of the Irrawaddy. The reason for such an altogether arbitrary rule is this. Beyond Myitkyina the Sino-Burmese frontier is in dispute. The Burma Government claims one frontier, which it has surveyed and demarcated with boundary pillars; the Chinese Government claims another, but has not yet produced maps or documents to support the claim. But the Chinese Government, that is to say Nanking, hardly speaks for Yunnan, the province directly concerned, or did not in 1930. The Yunnan Provincial Government recognized no frontier. All Burma would hardly satisfy its claim to a place in the sun. It openly claims the Kachin country lying between the two branches of the Irrawaddy known as the triangle; and its secret ambition embraces the jade mines, to the west of Myitkyina, since most of the jade found there goes to China. Perhaps by way of politeness, the Chinese Government pressed the Burma Government not to employ Chinese mules on any enterprise east of the Mali Hka, thereby tacitly acknowledging Yunnan's claim that this was Chinese territory; and the Burma Government gladly consented.

Hitherto that saddle-galled, knock-kneed, undersized, underbred, long suffering, entirely reliable brute, the Yunnan mule, had held as it were the key of the North-East Frontier of India in its possession; or rather his owner had. No military expedition against the tribes was possible without his help. He was indispensable. And Chinese contractors in Myitkyina had been well content to supply him in quantity. But the Yunnan Provincial Government could bring pressure to bear on these contractors (in ways that are heathen and not vain) and so cut off the supply of mules. The muleteers are Chinese subjects and have left wives and families behind in Yunnan. Nothing would be easier than for the Yunnan Government to hold them as hostages. Therefore the Burma Government took action. A transport strike would paralyse operations on the frontier, and a rising amongst the Kachin tribes might have serious consequences. Why then be always dependent, for a key industry, on the whims of a government as remote as that of Nanking and as capricious as that of Nanking? So the Burma Government took steps to maintain a supply of mules on the Shan plateau, to the east of Mandalay, and these could be requisitioned as required. I had only to say the word, and I could have obtained as many mules as I wanted from there. They would have accompanied me to Fort Hertz, and from Fort Hertz to the Tamai river. But as I would have to pay also for the two hundred-mile march from their quarters on the Shan plateau to Myitkyina and back, the hiring of these mules would have cost too much. I decided therefore to employ Fan Li San's mules to Fort Hertz, and thence to rely on local coolie transport.

One afternoon some of us in two cars went to the confluence for a picnic. The confluence is where the eastern and western branches of the Irrawaddy unite, twenty miles north of Myitkyina. The country enclosed by the two branches is called, as I said, the triangle; and at this point the plain ends and the hills begin. Long groins of rock stick up out of the river, and the water races and swirls over them as the two rivers meet.

We made a fire of driftwood on the bank and boiled the water, but were dismayed to find we had not brought the tea. As the men had undertaken to arrange the picnic, we were ashamed to confess this oversight to the girls, and hastily examined our minds for an adequate substitute. Cranbrook made the brilliant suggestion that we use the native Kachin tea which grows half-wild hereabouts, and a search in an old clearing was almost immediately successful. I scrunched up a few of the green leaves, hastily put them in the pot, adding boiled water, and hoped for the best. Then Boo and Betty arrived, clamouring for their tea. We watched their faces anxiously. Betty poured out a thin stream of sickly-green, hot liquid.

'What the —— ! Here, what's this?' she said, startled.

'Tea,' muttered Cranbrook, hardly believing it himself.

'Oh, it's a special native tea made locally,' I lied glibly. 'We always try to encourage cottage industries.'

Betty sipped it, made a grimace and threw it away.

'Damn you and your cottage industries,' she said tartly. But Boo laughed and tried to help us out by drinking the toxic brew.

After that the picnic wilted, since a picnic without tea is like a wedding without wedding cake. We tried to be hearty, but scarcely succeeded.

Later I found myself driving home in the warm fragrant dusk with Boo. She had a forgiving feminine nature.

Another day we went down the river a few miles to see the green parakeets come home to roost at sundown in the teak forest. Thousands came, screeching madly, till the sky was black with them and the air vibrated with their shrill wrangling. As the main body settled down for the night like a tall storm-cloud the noise of their wings was like the rumble of thunder. At last the chaffering ceased, and it was quiet.

On the afternoon of November 25th the muleteers

came into the compound and tied the loads on to the pack-racks, ready for an early start on the morrow. When they had gone, we should have three days' holiday before we ourselves must start. We could hire a lorry to do the fifty-five miles of comparatively level road and cover in one day what it would take the mules four days to do. At noon on November 26th the twenty-eight pack-mules and two riding ponies filed out of the compound and headed north up the cart road that leads to Fort Hertz.

Very recently the cart road had been converted into a dry-weather motor road — for light cars only — as far as Sumpra Bum, more than half-way to Fort Hertz. The sharpness of the curves had been blunted, gradients eased and the jungle cut so as to admit as much sunlight as possible; but it remained impassable during the rains and in fact glutinous after the recent storm in Myitkyina. It had by no means dried up yet. Nevertheless, Mr. Nicholson, the engineer in charge, was about to motor through to Sumpra Bum, 120 miles distant. He got there; but more rain fell in the hills, and he had to abandon his car temporarily and return to Myitkyina by more usual means. It was a safe undertaking, however, to motor to Tiang Zup at mile 55.

Watching the mules start on their 220-mile journey excited me. At last we were coming to grips with the real enterprise. The mules seemed to think so, too. The leading animals began to buck, and one, jealous to be in the van, raced down the road pursued by a hot and fluent muleteer, crashed into a fence, threw its load out of the saddle and danced a jig on the wreckage. The rout was stopped, loads were balanced again, belly-bands adjusted to sensitive hides, and the mules fell into an order of precedence which they understood and accepted and which lasted all the way to Fort Hertz.

Now for three days I could think of something else besides Irrawaddy exploration. At least I thought I could. Cranbrook enjoyed himself, duck shooting. I botanized and dreamed of glaciers and the open road to Tibet. Time stood still, as they say. We visited the bazaar, and bought such things as we had forgotten or hoped might come in useful.

The native bazaar, though it sells only cheap foreign mass-produced stuff — little of it of British origin — is always interesting. Here hard-headed and hard-up Burmese housewives are to be seen and heard pitting their wits against hard-hearted and hard-up Indian hucksters; and simple-minded hillmen are cheated by their more sophisticated town cousins. Unlimited time and an uncanny knowledge of just how far the other side will go are required in every transaction. The plutocratic but cautious Englishman, butting in boldly, smiles at his astuteness, when in a few adroit phrases, he beats the *baniya* down by twenty-five per cent; and the *baniya*, as he pockets his fifty per cent profit, sighs a satisfied sigh, only regretting that his customer was so abrupt! A little more finesse would have been amusing. He does not smile only because it is not part of his stock-in-trade to do so; and besides, why smile at a certainty! There is little to laugh at in taking money from a fool. Italian-made rugs, Austrian-made oil-lanterns, and Japanese-made everything else comprised the bulk of the goods displayed. Only the fresh fruit and not-so-fresh fish were of Burmese origin.

At last the great day arrived — November 20th. We were up early. A dense mist lay over the blue China hills, but it quickly dispersed as the sun rose. While we were breakfasting the cars arrived — a lorry-bus for our servants and personal kit; and two Chevrolet cars for ourselves, our hostess and the young ladies, who were to accompany us as far as 'Nsop Zup, forty miles up the road. To a chorus of farewells from our friends and a clicking of cameras, we started, the cars running easily along the flat. Soon we were well out of Myitkyina with only a bamboo Shan hut here and there embowered amongst trees and cultivation. We passed the confluence of the eastern and western branches and found ourselves presently beside the Mali Hka. The road climbed a little and wound about, so that we had to slow down (we were doing about ten miles an hour). At one o'clock we sighted the wooden houses of 'Nsop on a terrace and descended to the river. Halting at the white bungalow we had lunch. Then we had to separate. Our friends must return to Myitkyina, but we had another stage of eleven miles to do before we overtook our mules. It was hard to say a last good-bye to our friends who had come so far to see us off. We did not linger over it. We suggested that they should come out to Burma a year later and greet us on our return.

Our road now lay close beside the river, and was rough. The lorry-bus bumped and jolted and was bogged in the mud. About five o'clock we reached the bungalow at Tiang Zup and found the muleteers and orderlies waiting for us: they had arrived about noon after an early start that morning from 'Nsop. The loads on their pack-racks were neatly lined up outside the bungalow. No need to untie any of them. We had with us all we required for the next few days at least. When the lorry-bus had trundled noisily out of sight, taking with it our last messages to friends in Myitkyina, a heavy silence fell. Suddenly it was cold. An almost physical break had occurred between morning and evening; a parting. For days we had been accustomed to be made much of and admired. Before ever we left England we had been the darlings of Society. Important people in London had been glad to know us and shake us by the hand.

'When I was in Burma in 'eighty-five,' said a pompous general with a white moustache bristling under a rubicund nose, 'at the time of the third Burmese war, I remember jumping over a stockade near Mandalay, right into a mob of yelling savages.'

'What do you do about money?' asked a financial magnate. 'Do you take notes?'

'*Do* bring me back a teeny-weeny dog,' begged a great Society lady. 'Or a marmoset', added another. 'I have always wanted a marmoset, but my husband says you *must* clip its wings, and I think that's rather cruel, don't you?' And many other remarks of a like nature.

That was the glamour of exploration. We were pioneers; an almost lost world lay before us and the humdrum world applauded us whole-heartedly as we prepared to leave civilization and face the perils, the discomforts and the hardships of travel in the Irrawaddy jungle. We had been entertained and fêted wherever we went. Photographers had photographed and pressmen interviewed us. We felt grand and significant and enormously pleased with ourselves—until we remembered that we were living entirely on credit! As yet we had done nothing. Now at last we had to meet our liabilities. It is curious to reflect that when a man announces that he is about to start on an expedition he is far more fussed over than ever he is on his return, however successful he may have been. He has only to say that he is leaving to-morrow for Timbuctoo or Lhasa or the Orinoco and the most surprising people reveal a long-cherished desire to accompany him and an unexpected dissatisfaction with their present comfortable lot. But if you say you are just back from Timbuctoo (or Lhasa or the Orinoco) people say, 'Oh!' politely. They seem faintly apprehensive at the prospect of having to listen to a tendentious description of Timbuctoo (or Lhasa or the Orinoco). Until you are gone they can think of nothing else. By the time you get back they have forgotten you ever went away.

That evening Cranbrook and I were strangely subdued. Ba Kai's first dinner — a wet fish which he had apparently forgotten to cook — was unappetizing, and I felt ill and gloomy. The immediate break with friends and home comforts, however skilfully led up to, is always depressing. There was no one to rally us now. All our strength must come from within.

CHAPTER III

WHERE BURMA ENDS

In the morning we felt more cheerful. In an increasing light things look brighter than they do in the evening, and thoughts take their complexion from one's surroundings. We were light-hearted.

Not so our Chinese muleteers. They complained that their twenty-eight mules could not carry all the kit: one of the riding animals must be requisitioned. I protested to the head muleteer, pointing out that he himself had estimated the number of animals we should need; he must have annexed some of our mules for his own nefarious purposes. In any case, I said, he must carry our loads according to the contract. He wept, swore and raved. It was impossible. He was a poor man and his mules were all he had in the world. It would kill them to carry so much. The extra loads must be carried on one of the riding mules.

This was intolerable. I was prepared to walk most of the way to Fort Hertz, but only if it were absolutely necessary. I went carefully over the loads, and decided that we could afford to jettison, temporarily, two boxes of stores, which could be brought on to Fort Hertz by the post caravan passing in a few days' time. No sooner had the muleteer unlashed two of the boxes from their racks, however, than the *laopan* said smilingly that it would be all right now; they could carry everything!

Honour was satisfied. The boxes were tied on once more; and we started gaily on our first real march into the Burmese jungle.

It was the first of December. The heavy mist which at dawn had hung over the hills dispersed slowly. In three hours Cranbrook and I, at first walking to keep warm, but later mounting our ponies, reached the next bungalow; and at noon the mules arrived. We lunched; and the warm sunny afternoon was ours to spend as we liked.

So we settled down to the first fortnight of our new life. We would start about 8.30 a.m., complete the stage of ten or twelve miles before lunch and spend the afternoon collecting.

Tiang Zup, where we picked up the mules, is the last bungalow by the Mali Hka, until you reach the edge of the Shan plain at mile 195. From Tiang Zup, the road climbs into the hummocky hills. Occasionally you catch a glimpse of the river to the east, winding through its wooded valley.

The forest is evergreen, though a few of the trees do shed their leaves for a short season of the coldest weather. South of Myitkyina, it is the hot drought of early spring which strips the trees naked for a month before the summer rains; but the hot weather brings out the gorgeous scarlet and golden flowers of many. Although we were well north of the tropic, and two thousand feet above sea-level, the forest, right up to Fort Hertz, is not only evergreen, but sub-tropical. Outlandish vegetables, like palms, tree ferns and rattans (or climbing palms), screw pines, and bananas abound. There are also bamboos or giant grasses and woody climbing plants with immense leaves in great variety.

The botanical expert may meditate on the presence of fig trees of all shapes and sizes, a few bearing edible fruits not unlike the cultivated green fig, tall, palm-like *Araliaceae*, a family which acknowledges our ivy as a poor relation, laurels (not in the Victorian shrubbery sense, but handsome flowering trees unknown in the north), the ragged-looking tree called *Duabanga sonneratioides*, which bears large milk-white flowers beloved by birds, another tree called *Terminalia myriocarpa*, festooned with the myriad little red-winged fruits which spin in the air as they descend, and *Myristica*, the nutmeg tree. All these and many other trees despite a temperature which at night drops to 40° Fahrenheit. But there is all the difference in the world between 40° Fahrenheit and freezing point. Trees which never fear a frost — whose tender offspring, moreover, protected by the foliage overhead, are never subjected to temperatures below 50° Fahrenheit — are not very different from those found in forests near the equator. They get their share of hot weather, for the summer is very hot indeed. At Fort Hertz, the maximum temperature exceeds 90° Fahrenheit daily throughout July and August. No doubt in England, though we expect temperatures down to and below freezing point in winter, if it is not warmer than 50° Fahrenheit in July we shiver and talk of fires in the evening; but a North Burma winter is no colder than a cool English summer, and we only felt the cold now because we had just come from a warmer place.

Temperature, however, so far as the forest is concerned, is of secondary importance. What counts is a moist atmosphere. Many tropical trees extend far beyond the tropic, and put up with uncomfortably low temperatures so long as the air is wet. On the road to Fort Hertz we saw the moisture in the air for ourselves. Almost every night, as soon as the sun set, the stars which had begun to shine, blinked and went out; the air curdled and before midnight a thick mist swaddled the silent world. Sometimes, on a hilltop, we were high above it and would look down on rivers and lakes of cold milk-white mist; but more often we were *in* it. Then we were glad to light the wood stove in the bungalow, until it glowed red, and sit round it, sipping hot rum, before going to bed. In the early morning the mist began to heave and roll, and lift, and by ten or eleven o'clock the sun would be shining from a cloudless sky. But where it had come into contact with anything the mist had deposited itself in drops and soaked through. We heard it dripping heavily from the trees. So the foliage was washed daily, and after that the roots were sweetened, and there was no need for the forest to shed its leaves. Presently temperatures would increase and the wind gradually change direction, blowing up from the Bay of Bengal. Hills and plains, too, would be deluged with rain; then the trees would swell and burst into flower, and send forth new leaves to replace the old ones, which would drop off gradually.

At first Cranbrook remarked on the absence of life in the forest. But presently during the hours of sunshine we saw many birds and an occasional white-faced hoolock or gibbon (*Hylobates hoolock*) left behind by the troop, swinging after his companions. Cranbrook soon 'got his eye in' and began to see squirrels. One had only to follow some native track into the depths of the jungle, and keep quiet; sooner or later a chestnut-bellied squirrel, or the giant black squirrel as large as a cat, called Ratufa, or the little striped squirrel called Tamiops, would appear. The Ratufas generally go about in company, sometimes three together, and Tamiops usually in pairs. Walking quietly ahead of the caravan in the morning, we saw birds, monkeys and squirrels along the road and shot specimens daily.

On December 2nd, about 1.30 p.m., we felt a very distinct earth tremor, which shook everything in the bungalow; but nothing more followed.

We had started a collection of insects, mainly beetles, and this occupation gave us plenty of interest. Whenever we came to a large log of wood or a stone, we gathered round it armed with killing bottles, and proceeded to roll it over if we could. The sudden light startled the underworld into life. Small beetles scurried this way and that. There were vicious-looking centipedes and bloated wood-lice running madly about. Little black scorpions turned up their tails and adopted an aggressive attitude. These last were more common inside the wood logs than under them — especially where white termite ants had been at work. Those who are familiar only with English or even with European forests would be surprised at the work performed by the hordes of insects and other creatures which work in the dark in the Burmese jungle. Even at this off-season, prodigious numbers of small sappers and miners were at work. A thick tree trunk is reduced to dust in a few months by a termite army. Nor were all the insects we discovered subterranean. Butterflies and grasshoppers, dragonflies and beetles were numerous on warm afternoons in every open place. It was surprising how many of the smaller grasshoppers were one-legged, as though they had each lost a limb during some titanic upheaval, or perhaps only in domestic strife with the more bulky females. Huge locusts with a bright green fuselage, utterly sluggish when the morning mist lies on the ground, became active in the heat of the day, when the shade temperature rose to 70°. These locusts are awkward in the air, flying clumsily and rather slowly when disturbed; but their colour keeps them concealed; often the first intimation one had of their presence was a whirr of wings. They would travel in a straight trajectory, as though loosed from a gun, until they hit against an obstacle. Usually they fell down, but sometimes they clung to the frail support of a leaf or stem. They never seemed to have the power to change their direction while in flight and always kept on their course until stopped suddenly by impact.

Most of the cold-weather butterflies we saw were small drab, shade-loving insects, their wings dazzle-painted with bars and spots. They are weak, and fly slowly, with a zigzag, dipping motion.

This section of the road from Tiang Zup to Wasat Hka, a distance of sixty-six miles which we covered in six days, is very lonely and we saw neither villages nor natives; nevertheless there are Kachin villages on the surrounding hilltops, and the near presence of man was proclaimed by the secondary growth through which we passed. Like all the hill tribes of north-east India, the Kachins cut and burn the forest to make way for their crops. After a season the site is abandoned for some years, and a tangle of soft, fast-growing plants springs up. From the composition of this growth, which alters year by year, one can determine roughly how long it is since the forest was burnt down.

At this season there is always a certain amount of activity on the road. We passed strings of bullock carts, resting. They have their own halting places between bungalows and travel chiefly in the early morning or at night. Each cart carries from 400 to 600 lb., at a speed of one and a half miles an hour, and the Indian drivers fall fast alseep. Thus we were not surprised to see an occasional cart off the road or upside down in the jungle, abandoned for the time being. These carts carry government stores to the outposts during the dry weather; but, though the road is alleged to be an all-weather cart road as far as Sumpra Bum, traffic is suspended during the rainy season. No mules can live here then, so that communication between Myitkyina and Fort Hertz is entirely dependent on bullock transport which is quite unmoved by the myriads of biting flies or the diseases they bear. In the near future mechanical transport will do the work. The road to Sumpra Bum was already to have been made fit for lorries at all seasons; but this had not been done.

On December 7th we left the main road to climb the hill to Sumpra Bum, the district headquarters, which lies to the east of the Fort Hertz road. It was a wet day, and we arrived soaked and, having ascended 2000 feet,

chilled to the bone. We stayed with the Burman Assistant Superintendent, Maung Kin, a friendly little man who in this lonely outpost lived half European, half Burmese fashion. The Assistant Commandant of the Burman Military Police who was quartered here also called, and Mr. Nicholson of the Public Works, who had just made the pioneer motor car journey from Myitkyina. Nicholson also was going on to Fort Hertz; but not by car. It was pleasant to have nicely served meals again after a week on the road. Ba Kai did his best, but he was not much of a cook; and though the two Nung orderlies tried hard and the bungalows supplied everything except meals and bedding, the standard of living was distinctly lower after we left Myitkyina.

In order to simplify meals at the start, I had brought an entire ham, which my hostess in Myitkyina had cooked for us in spiced beer. This ham was our great standby. Morning and evening we ate ham and it stood up well to the onslaught. However, constant erosion was telling on it, and at the end of a fortnight there was not much ham left. As it was now beginning to grow whiskers and smell faintly high we decided to clean it up. While scraping off the whiskers, we broke through a sort of crust into a cavity out of which wriggled a seething mass of maggots.

Ba Kai tried to cook chickens, but was not very successful. He did better with eggs. A dozen loaves of bread and a few fishes we brought with us from Myitkyina were soon finished. After that we ate chupatties and biscuits. The bungalow *chowkidars* (watchmen) sold us chickens, eggs and sometimes a little milk; but we could get no vegetables and our butter came out of a tin. We had brought a sack of potatoes and onions in Myitkyina. These lasted us to Fort Hertz, where we replenished supplies. On the road it is hardly possible to get anything.

We did not linger at Sumpra Bum, having given up one day to go there. The direct road to Fort Hertz goes from Wasat Hka to Machega; and on December 8th, the weather being still wet and the hills enveloped in clammy cloud, we did the short march from Sumpra Bum to Machega, thus regaining the main road. It was a pity the rain came just then; otherwise, from the hill overlooking the outpost, we should have had a fine view over the country from the Mali valley into the triangle of unadministered territory which lies between the two branches of the Irrawaddy. Probably rain falls at least once a fortnight, and the cold-weather disturbances usually last from three to five days.

By the 10th fine weather had set in again, and we caught sight of snow on the high range to the east, away over the far side of the 'Triangle'. We were now more than half-way to Fort Hertz, and we resumed our collecting routine.

Cranbrook shot squirrels daily. The ordinary squirrels (there were two or three species, one with a silvery grey, another with a bright chestnut belly) were not difficult to get; but the striped squirrels, Tamiops, and the black Ratufa were less easy. Tamiops never comes down on to, or even close to, the ground like an ordinary squirrel. He keeps high up, and when he splays himself out against a tree trunk, looking more like a lizard than a squirrel, he

becomes almost invisible. Moreover, he can run vertically up or down a tree trunk and is very quick, though he cannot leap from tree to tree as nimbly as his chestnut-bellied cousin: his way is to jerk forward and then stop. There were plenty of these Tamiops. It was unusual to go into the jungle for a couple of hours and not see or hear one. When alarmed they chirp a shrill, monotonous 'Tchk, tchk, tchk!' Tamiops never flirts his tail, and his stripes tend to make him quite invisible against the tree bark. Ternam Nin the orderly became a useful shikari, and a Ratufa he shot served us one evening for a meal. This animal is entirely black, except for a pale yellowish band under the throat, and his tail is longer than his body. He is a pretty creature, with rather sad eyes, but his expression is marred by his large rather prominent rodent teeth. His flesh, though tender, proved tasteless.

The birds we saw were as tropical as the forest trees. Nevertheless the avi-fauna of far northern Burma is of peculiar interest to zoologists, since this is the meeting-place of the eastern Himalayan, central Asian, Chinese and Malayan sub-regions. Most conspicuous were the hornbills which frequently flapped overhead; and most gaudy were the woodpeckers. Once I saw nine hornbills together, which is said to be lucky, though greater flights up to twenty or more are seen. There are said to be three species; at any rate the Kachins have three different names for them. But as they also recognize and name an incredible number of bananas, far more than any botanist would dare to distinguish, I suspect them of being hair-splitters.

The Indian rufous piculet (*Sasia ochracea*) looks and behaves like a small woodpecker, but his beak taps against nothing harder than reeds, to which he is minute enough to cling. A drongo with long forked tail, resembling two wire springs, feathered at their ends, afforded us some amusement; when in flight, only the trembling and expansions of the wire-like tail were visible, and we got the impression of two very small birds chasing a larger bird, but always keeping exactly the same distance behind.

We saw plenty of game birds; but our shooting was erratic, for I don't remember that we ate many. However, there was at least variety, with green and imperial pigeon, jungle fowl and Kalïj pheasant, all of which went into the pot and most of which were added to the collection. One morning I surprised five jungle fowl together on the road. I had no gun, and as a rule the wary jungle fowl does not give you a second chance. I sent back news of this unusual flock to Cranbrook, who came up in time to bag one. Nearing the Hkamti plain I saw seven duck flighting.

An all-weather cart road in the hills means something better than a road wide enough for a bullock cart, with gradients not exceeding one in six. In so wet a climate the road must be properly surfaced and thoroughly well drained. Above all it is necessary to allow the sun to reach the road as much as possible. To achieve this the jungle on either side is cut back for some distance. Secondary growth takes its place. This too is cut every year, and so it also gradually changes. Thus, toward Myitkyina and the plains, a rank growth of *Ageratum conyzoides* covers the banks and borrow pits; whereas in the hills bracken appears. Here and there solitary big

trees are left standing close beside the road, either to support the telegraph wire or for some other reason; but almost every one I noticed was dead or dying. What is the reason? Probably trees grow in the forest which out in the open cannot survive, lacking the protection of their fellows. At first they strive for immortality by changing their habits, and trees evergreen in the forest tend to become deciduous in the open; but gradually they wilt and perish.

The Burmese jungle seems deathly still. A deep, minatory gloom prevails. Listen carefully, and make no noise; presently you will begin to hear little sounds difficult to locate, such as the muffled chatter of birds, bamboos scraping together, the tinkle of distant water or the tapping of a woodpecker. A fruit hurtles down with a loud plop and startles you; or a squirrel gives a truculent cry. But most noises are low, almost furtive. There is not much movement. Suddenly, inexplicably, a leaf begins to twitch to and fro in a maddening rhythm, as a faint current of air moves it; then a banana leaf starts to flap idly. The passage of a pair of hornbills sounds quite loud. At dawn the gibbons greet the day, and as the rising sun curdles the mist they troop off into the depths of the jungle. But the baboons cough and grunt very discreetly to each other, and suddenly the trees shiver and shake to their feverish gymnastics as they take alarm and go helter-skelter.

It is not easy to get through the jungle. The tree trunks may not stand very close to one another, but the intervening space is filled with the ribands and ratlines of tall climbers, which rip and tear and pierce the flesh.

Nor is the secondary growth any kinder. Here are plants only too anxious to give you some memento of your visit; fruits which stick or hook on to your clothes or, worse still, bore into them. There is an abundant grass whose hard pointed fruits penetrate your clothes and then start boring into your flesh. The mules, which waded belly-deep in the bush-grass along the edge of the road, became completely matted.

On December 13th the weather was gloriously fine. We looked northward across the waves of the lower hills and saw for the first time the horseshoe of white mountains which clasp the plain of Hkamti Long. It was a wonderful spectacle, those snow-covered ranges standing against the blue sky, and I gazed at it for some time in rapture.

'Where Burma ends,' I said to Cranbrook, pointing to a peak nearly 15,000 feet high.

On the 15th we reached Nawang Hkai on the bank of the Mali Hka, where the river abruptly leaves the plains. Just below this bungalow where the Nam Yak flows headlong into the Mali, is an earth-shaking rapid, and beyond that again a deep pool, famous for the enormous mahseer, up to ninety pounds in weight, which have been hooked in it.

We slept at the edge of the plain, and on the 16th completed the last stage of thirteen miles in an almost dead straight line through high grass across the uncultivated swamp. At noon we rode into Fort Hertz. And the first news we received was that a bridge ahead of us was completely broken down.

CHAPTER IV

TRIALS OF THE MODERN EXPLORER

EXPLORATION means days of boredom punctuated with moments of ecstasy. No bogus novelty will serve to induce these moments: it must be 'the real thing', on however small a scale. But the discovery, when it comes, and the experience, when it is reached, have all the excitement that exploration ever had in the days when it was still possible to discover oceans and continents. And for the sake of these moments the explorer is prepared to be something of an ascetic and accept the rest.

We were now in for what I suppose were days of boredom. My idea had been to spend only three or four days in Fort Hertz and reach the Tamai river for the New Year. Now, because of the bridge, we were committed to staying there over Christmas. Yet even this had its advantages. It meant at any rate more than a week of something like home comforts. And that was a good deal. On the march to Fort Hertz we had met with good lodging: the bungalows which mark the twenty stages from Myitkyina are well-appointed. But the plain cooking of Ba Kai had been very plain indeed. So we were not altogether sorry for the delay.

In the meantime, Mr. Leedham, the Assistant Superintendent at Fort Hertz, had sent out instructions that a temporary bridge was to be built over the Nam Ti. But it would take some days.

We were at Fort Hertz, then, from December 16th to December 27th. Every morning when we awoke we looked across the honey-coloured plain to the mountains, the Assam ranges to the west, the Tibet ranges to the north and the Chinese ranges to the east, white with snow; but the fertile plain which is less than 300 miles north of the Tropic of Cancer (about the latitude of Palm Beach, Fla.) and less than 1500 feet above the sea — though we had crossed the mountains to reach it — enjoys a climate where rice and oranges are cultivated and palm trees grow. Frost is unknown. For seven months of the year the heat is oppressive and the atmosphere very humid. The average annual rainfall is about 160 inches; but on the neighbouring hills it is much higher.

We found only three Europeans at Fort Hertz. They were Leedham, Captain Geake, an Assistant Commandant of Burma Military Police, and, temporarily, Nicholson, who had gone to bed with influenza.

My first task was to pitch the tents and see that they were in good condition. We erected a model camp outside Leedham's bungalow. My next, to send Ba Kai to have cooking lessons. Various cooks took him in hand, but the net result was that he acquired a taste for exotic cooking and would ask for nutmegs (we had not even brought a grater) or rennet to make junket, so we sent him back to plain cooking, which became plainer as the weeks passed. There was also the matter of personal servants. Our two orderlies had to be demobilized and sent to their villages — they would much rather have come with us — and we had to find others to replace

them — men who could speak Hkanung. Several men volunteered to go with us, but, after being examined by the doctor, were rejected on jurisprudent grounds. Eventually we secured the temporary services of another sepoy on leave. Meanwhile both Leedham and Geake had gone away, and we had Fort Hertz to ourselves.

The Chinese muleteers from Myitkyina were now paid off. We had to pay them for the return journey, just as though they were returning empty, although we knew they would not return empty. There is a lucrative business of buying rice in Fort Hertz and selling it in Sumpra Bum at a price which more than pays the freight; and we saw our mules go off well loaded.

We hired twenty-five Shan mules for the four days' journey to the Tisang river (Nam Tisang). The remaining loads would have to be carried by coolies. From a Chinese merchant I bought 1200 lb. of rice, 120 lb. of flour, 120 lb. of crude salt (invaluable for barter in the jungle) and 60 lb. of *dhal* (dried split peas). I also bought four tins of kerosene for our lamps and a tin of sweet cooking-oil, probably made from rape seed.

On Christmas Eve twenty-five coolies started in advance for the Nam Tisang, with rations and stores boxes. I expected to find these already arrived by the time we got there.

Cranbrook went out shooting every day and generally brought back one or two squirrels. Once he shot the squirrel-like Tupaia, really a small insectivorous creature which runs about on old walls or in the forest; and the word having gone forth that we wanted animals, a native brought us a mole. It had, however, been dead some days, and, though no doubt just right for the pot, was all wrong for the museum. We did not eat it. Sometimes I went out with Cranbrook for a few hours; but the only interesting tree I found was *Magnolia Griffithii*, and that wasn't in flower. However, I added my quota to the zoological collection by catching a bat in a butterfly net, after an exhilarating pursuit.

Fort Hertz, formerly called Putao after the native village of that name, stands near the middle of the plain called Hkamti Long, which although only one thousand four hundred feet above sea-level is entirely surrounded by hills several thousands of feet higher. The plain itself is inhabited by Shans, a people akin to the southern Chinese, the Assamese, the Siamese and the people of the Shan States. These Hkamti Shans, however, are entirely cut off from their neighbours by the hills, under cover of whose jungles live various tribes more closely related to the Tibetans. Thus already we were encountering different peoples, civilizations and languages.

We had started from lower Burma. North of Myitkyina we entered the Kachin hills, though we did not pass through many Kachin villages or even see many Kachins. Now we were among an isolated colony of Shans. Our next journey, over the hills to the east, would take us among the Hkanungs, who are related not to the Shans but to the Kachins; then northwards into the wildest valleys of all where dwell the Darus. Finally we hoped to reach the shifting fringes of the true Tibetan stock and perhaps enter Tibet itself. Here was a great mixture of languages. Burmese, Kachin or Chingpaw, Shan Khanung, Daru and Tibetan,

with Chinese for the muleteers and Hindustani for our servants! But the only language which would be of immediate value was Daru, a dialect about as close to Hkanung as the dialect of Lancashire is to that of the University of Oxford, sufficiently like Hkanung, that is to say, to be intelligible to a Hkanung after a little practice. We found a second servant at last in the person of a raw youth who was called by the provocative name of Sin.

Leedham returned at noon on Christmas day, and that night we had a gala dinner. The next morning he left again for the country. The bridge over the Ti Hka was finished, and there was nothing to keep us in Fort Hertz. The muleteers came that evening and tied up seventeen loads. We arranged to start on the 27th.

Fort Hertz is only fifty miles (as the crow flies) from the sources of the Mali Hka, that is the western branch of the Irrawaddy. But it was the eastern branch we wanted to explore. To reach that we had to travel eastwards, or rather north-eastwards over the hills which separate the two. It would of course have been possible, though difficult, to travel directly up the 'Nmai Hka from Myitkyina; but it is very much easier to follow the mule road to Fort Hertz, and from there cross to the eastern river. About the latitude of Fort Hertz, the 'Nmai Hka itself divides into two main branches, the Taron (east) and the Tamai (west). The former is the main stream; the Tamai is its biggest tributary. And it is possible, on reaching the Tamai, to follow it down to its junction with the Taron, and then turn north again up the Taron. But again it is simpler to follow up the Tamai. Could we reach the source of the Tamai? And if we did, was there any way of crossing the ranges to reach the upper Taron? By the time we reached the sources of the Tamai, we should be amongst high snow-covered mountains on the edge of eastern Tibet. Could we cross the Burma-Tibet frontier? Was there a route? We could try. And by crossing the last headwater streams, we might determine the true source of the Irrawaddy. The first part of the journey was successfully accomplished. We now set out to reach the Tamai, whose source lies in unadministered territory. The Taron, however, rises beyond Burma altogether, in uninhabited country nominally a part of eastern Tibet.

The usual dense mist lay over the plain on the morning of the 27th. We breakfasted in silence. There were no huzzas for us now, and indeed no one came to see us off: all the Europeans had already gone about their own business. The muleteers arrived with their animals and started off independently. In a few minutes, the whole party was swallowed up in the thick mist. There were still six loads left over and no more mules or coolies. Messages were flying to and fro between us and the Shan chiefs; but in the absence of Leedham, nothing very definite happened. At last, just as our patience was beginning to exhaust itself, an elephant — last sign of the fading glory of the Shan chieftain — arrived with a crowd of attendants. The six loads were tied on his back, and at ten the rear-guard started. It is unwise to be separated from your transport in Asia, but sometimes it is unavoidable. There was nothing to be feared. The first day's march lay across the plain to the foot of the

hills. We had hired a primitive canoe to take us down the river and so save us the trouble of walking: it was noon before the canoe was ready. I don't recommend this means of transport on the Hkamti plain. A Shan canoe is not the comfortable craft in which one idles away a summer evening on the Thames, for example. It is a solid dugout tree trunk, about as buoyant as a tin pail. Hour after hour we stiffened in our seats, crouched in the bottom of the canoe, afraid to budge lest we capsize the un-river-worthy craft, while it drifted down the sluggish Nam Palak towards the Mali Hka. Arrived in the main river, we disembarked, very stiff and very glad to walk the last two miles to Kankiu. We passed the elephant, rolling along, but missed the mules. We expected to find them arrived before us since they had started three hours earlier, but there was no sign of them. The elephant padded in an hour after us. We examined the six loads, one by one: our camp beds, a table, kerosene oil, a box containing jars of formalin for preserving snakes, a botanical press with paper and two tents. From our haversacks we produced between us some tea, a loaf of dry bread, and half a tin of curry powder. Cranbrook and I looked at each other and laughed. We sat down and waited.

Between Fort Hertz and the Tamai river there are rest-huts to sleep in, quite comfortable, but bare of furniture and fittings. So here at Kankiu, on the bank of the Mali Hka, we were without food or bedding on a cold December night — yet with a roof over our heads. We lit a fire, and at 5.30 p.m., having had nothing to eat since 7 a.m., ate lunch. At this point Ba Kai came with tidings. A man had gone back to find the mules and bring on our bedding at all costs. Further, he said, the twenty-five loads which had left Fort Hertz on Christmas Eve, three days ahead of us, were still here. The misfortune had its compensations, however. Here was food, the better for being unexpected. We opened a box of stores and got out a tin of sardines and other luxuries. I also found my uniform case containing winter clothing, and with several extra garments, a couple of waterproof canvas sheets, and our camp beds, one on either side of the fire, I felt we shouldn't have such a bad night after all. We supped off chupatties and sardines, washed down with tea, and before 9 o'clock we turned in. We were cold no longer. I had just fallen asleep when I was awakened by a terrible din coming from the next hut. Men were bawling to one another, and through the bamboo mat walls I saw the glare of torches. Something was the matter. At that moment Bai Kai dashed in, very excited. 'Tiger! Tiger! *Thakin*!' We sprang up, seized gun, rifle and torch and were outside in a moment. A curdled mist off the river covered the ground, but thanks to a bright moon we could see well enough. A man was shouting from the next hut, thirty yards away, and we raced across. It seemed that a tiger had just carried off a pig from beneath the hut. But though we searched right up to the edge of the jungle, we saw no sign of the tiger: not even the crunching of pork disturbed the stillness. The tiger had come and gone like a wraith into the dense jungle which surrounded the village. Only the owner of the pig had seen him, pale in the misty moonlight.

The sudden squealing of the pig underneath the hut, as suddenly checked, had warned him as he lay on the mat floor of his living-room only two feet off. On the way back to the bungalow I slipped off the raised wooden plank, which is the village path, into a buffalo wallow, a regular slough, and emerged looking something like the dough boy in *Struwelpeter*; only black. We returned to bed but the excitements were not yet over. We had just fallen asleep for the second time when the clamour again broke out. This time I was indifferent and refused to budge. Alarums I could not help, but excursions, no, not if a team of tigers arrived. The noise, however, went on, and now who should appear but the messenger who had been sent to find the lost mules. He had brought three of them with our bedding. While our beds were being made, we learnt that the muleteers had taken the wrong road in the mist and lost the way. One of the mules had fallen into the river, but it had been rescued. When darkness came on, the muleteers had camped. Then our *pyada* arrived and, late as it was, insisted on bringing on three of the mules with bedding, food and cooking pots. The rest would join us in the morning. So we slept happily.

When we awoke at six it was broad daylight, cold and misty. I expected that we should have to spend the day here, but the missing twenty-one mules arrived in good time, and shortly after noon we started. I told the headman to send on the twenty-five coolie loads as soon as he could get the men and to hurry up about it. He produced half a dozen immediately, and they came along with us. The elephant had given up.

Now at last we left the plains for good and started into the hills. We should not see a flat plain again for a year. We climbed steadily up the first slope and were lost in the clouds. However, we had started so late on a twelve-mile march involving an ascent of over 3000 feet that it was evening by the time we reached the pass, and the steep descent through heavy forest to the Ti Hka, a brawling rocky torrent, was made in complete darkness, through which the moonlight filtered patchily. Ba Kai, cheering on the lagging mules, did not arrive until 7 o'clock, but by that time we had made ourselves some tea and eaten a few biscuits. The seven hours' fast did not trouble me, but Cranbrook was worried by having to go so long without anything to drink. We got to bed at 11 p.m. and the seventeen-hour day seemed only too short. Nothing had gone very well, but then nothing had gone very ill either. Nineteen loads had been left behind. We started the march four hours late and consequently arrived after dark: the mules could not keep up. On the other hand, the nineteen loads would arrive one day; we had completed the march; and we were feeling well and strong. Cranbrook had shot a squirrel, and I was enthralled to find myself in the Burmese hill jungle. It was the coldest season of the year, and since there would be no leeches or blister flies we could march in comfort and arrive with unpunctured skins.

Between us and the Tisang river was a range of hills higher than anything we had crossed yet. It took us two more days to reach the pass or, rather, ridge, along which we walked for several miles. It is nearly 6000 feet high. I had been this way four times previously: once in 1922

and thrice in 1926. But I never crossed these ranges without finding something new.

Beyond Fort Hertz we entered upon a new type of forest. It was no longer sub-tropical like the Kachin Hills and the valley of the Mali Hka, but might be called hill-jungle. Nevertheless, the heavy rainfall and high humidity made it outwardly resemble the sub-tropical jungle with which we had grown familiar. The trees were in three distinct tiers, of big, medium, and small trees and shrubs, respectively. Above 5000 feet, rhododendrons began to appear. On the rocks, begonias grew in variety, and a few were in bloom.

The first time I passed this way in November 1922, after crossing the mountains from China by way of the Salwen valley and the Taron, I had found a remarkable slipper-orchid in bloom in the hill-jungle. This was two or three days before I reached Fort Hertz. It was a very wet day, pouring with rain. I was not well and had already marched several hundred miles from Likiang in Yunnan. There is no doubt that I was not very observant on that day. And yet I did see the slipper-orchid, a single plant, and I collected it. That evening, when I came to catalogue my specimens, there was no orchid! It had fallen out of my bag, which was crammed with specimens. Regret sharpened my memory, photographed every detail of the incident on my mind. Through four long years I remembered it. I could see the orchid in my mind's eye quite clearly, a glossy chocolate brown slipper, with a white and green standard, and I knew exactly where it grew and what it looked like. As soon as I saw the place, I should halt and say:

'My slipper-orchid grew just *there*.' Some day I would pass that way again, if only to gather the orchid. And so it was. I travelled this road in April 1926, when I was making for the Tamai river. In August, on my way back to Fort Hertz for a rest, and again in September, on my way through to Assam, I passed the very same spot. But I could find no slipper-orchid. Each time it rained heavily, and the undergrowth had grown up breast-high. I could see no sign even of the mottle leaves of the lost orchid, and I shrank from crawling into the leech-ridden jungle to search more closely. It is in the winter months that one must search. April is already too late. August and September, in the height of the rainy season, are hopeless.

Another four years passed, and I had not forgotten my slipper-orchid. On December 29th, 1930, I came to the very spot where eight years previously I had found the plant. There indeed was my lost treasure, again one plant! It is a handsome orchid — the stem, bearing its single slipper, about eight inches high. The dorsal petal is ivory white, sharply striped with emerald green, the slipper a glossy coffee-brown, and the narrow lateral petals heavily mottled in ochre and sienna, with bristly margins. This orchid is confined to limestone rocks, which crop out on this range. But now, after finding the first flower, I found dozens. It was the flowering season, and my new Cypripedium was as common as the greediest orchid-hunter could wish. I found it on each of the ranges we crossed between the Ti Hka and the Tamai and again farther north in the Tamai valley itself.

On December 7th, 1931, on the return journey I

collected several dozen plants from the original spot, and posted them to England from Fort Hertz. They flowered in 1933, and my Burmese slipper-orchid, which it had taken me eight years to collect, received the name of *Cypripedium* (or *Paphiopedilum*) *Wardii*. There is no doubt that the cutting of the bridle path from Fort Hertz is responsible for its increase in recent years. Plants quickly spread along embankments and railway cuttings, and along the open banks of well-defined jungle roads such as this.

In 1926, during the height of the rains in August, though I could not rediscover the slipper-orchid, I had found a beautiful little epiphytic begonia growing only on the rough-barked tree trunks above 5000 feet: a frail and tiny thing, but a work of exquisite art. It hid in the warm, saturated air of the jungle itself and loved the rain. It had white jewel-flowers and leaves like a filmy fern; but now I sought it in winter. I knew the very tree on which I had first seen it, yet I found it only with great difficulty, a shrivelled white skeleton, nothing of it visibly alive. But the queerly shaped, winged capsule (fruit) was unmistakable, and, though most of the seed had been long since scattered, I saved a little and sent it home. Apparently it did not germinate, and so the charming *Begonia hymenophylloides* remains a herbarium mummy. It is a greenhouse plant and would be difficult to keep alive.

December 30th was a glittering day. When we reached the top (there is no actual pass, the road following the crest of the ridge for several miles) we could see a great distance in all directions. Conspicuous to the east was a high range covered with snow, which must have been on the Chinese frontier, fifty or sixty miles distant. It was wonderful to think that we could see China. Below us a white lake of cloud filled the valley. Along this ridge grew several rhododendrons and the curious tree *Bucklandia populnea*, one of the largest trees in the forest. The leaves on a fully grown tree are much smaller than they are on saplings. Birds eating the seeds, and twigs bearing leaves and fruits were scattered on the ground. Another conspicuous, medium-sized tree — though it often begins as an epiphyte — was a species of *Eriobotrya*, leafless, but bearing fruits as large as walnuts, which hang on the tree for six months or more. There were grave-looking oaks, *Illicium*, with leathery evergreen leaves and star-like fruits, stumpy tree-rhododendrons and others, epiphytic, covered with white flowers; and there were big laurels, draped in curtains of salmon-pink foliage. A magnificent white-flowered climbing jasmine in full bloom attracted our attention. We were in a wild region where there is hardly any population, since no land here above 3000 feet is fit for cultivation. Tigers, leopards, wild dogs and other beasts are common. But so steep are the slopes, and so thick the jungle that it is impossible to get along once you leave the bridle path. Descending from the high ridge, we reached the banks of a wide but shallow river, the Nam Tisang, on the last day of the year. The water was only waist deep. Some men in a canoe were beating the water with their paddles and shouting out to a school of fish which seemed too bewildered even to swim into the trap prepared for them.

CHAPTER V

WE RECEIVE AN OMINOUS LETTER

BEFORE leaving London I had worked out an itinerary and a time-table. On January 1st, according to this, we were due to reach the Tamai river. Actually we reached the Tamai just seven days later, but had it not been for the broken bridge which delayed us at Fort Hertz, we should have been there on time.

Nogmung is a Hkanung village which has become Christian: every evening we heard the proselytes singing hymns horribly out of tune in the village chapel — a converted hut. From Nogmung we sent the Shan mules back to Fort Hertz; the men did not want to accompany us any farther: and it was becoming increasingly difficult to feed twenty-five hungry mules in the forest. The elephant would have done better for himself; but he could not have faced the hills. Henceforward everything had to be carried over the mountains on men's backs, and we required nearly eighty coolies. We had over 4000 lb., nearly two tons of baggage for a year.

This baggage consisted of rations, stores, camp-equipment, scientific equipment, medical comforts and personal effects. We had only enough rations for ourselves and our servants for about six months; but we could get more from Fort Hertz if the necessity arose. Our stores were packed in eighteen three-ply chop-boxes with metal covered lids, each chop-box weighing about 50 lb. Stores included, in addition to a few delicacies, certain necessities in bulk, such as 40 lb. Bovril Pemmican, 120 lb. plain Mexican chocolate, a large supply of tea, coffee, biscuits, butter and tinned milk.

The camp outfit comprised three tents, camp beds and blankets, tables and chairs, luncheon basket and cooking pots. Our personal tents weighed 60 lb. each and were of the ridge-pole type with double fly. The third was a very light alpine tent capable of holding two men; either of us could easily carry it.

Scientific and collecting equipment included two twelve-bore guns, a rifle and a large quantity of ammunition; cameras and field glasses; botanical drying paper and presses: dissecting microscope, thermometers, hygrometers; boiling-point apparatus, pocket barometers and compass.

The medical comforts included a case of non-vintage champagne in half bottles, two cases of Jamaica rum, and enough quinine to deafen the entire Daru population. Also the usual remedies and antiseptics of our medical cabinets at home.

Finally our personal effects included little beyond a few books, writing paper, diaries and clothing suitable to all sorts and conditions of weather, but chiefly unlimited rain and plenty of snow. Actually we relied on ski-suits, as being wind- and possibly leech-proof, with warm underclothing and stout, heavily nailed climbing boots.

Our nearest post office was Fort Hertz. All letters and anything more we required had to be brought from there by special runner. There are small Chinese shops in

Fort Hertz, but naturally they don't carry much stock. Myitkyina with its native bazaar was a better shopping centre, but, if it came to that, one might as well go a little farther afield to Rangoon itself where there are big shops. Letters posted in Rangoon reach Myitkyina on the third day, and if they just catch the weekly mail to Fort Hertz they arrive there ten days later in the dry season or a fortnight later in the rainy season. Thus the shortest time for letters and parcels between Rangoon and Fort Hertz is two weeks. Letters from England, however, always reached Myitkyina the day after the mail for Fort Hertz had left.

I had arranged to have a weekly consignment of tinned bacon and sausages sent from Rangoon to Fort Hertz; and Leedham promised to have a monthly mail sent out to the Tamai valley to meet us. The time which elapsed between our mail leaving Fort Hertz and its delivery in our camp varied a good deal with the postman, the weather and where we happened to be at the time. The record was about fifteen days; the average, three weeks.

After the mules left, we were delayed by the Nam Tisang for three days. Relays of coolies were arriving and leaving with loads for the Tamai river all the time: twelve on January 1st, sixteen on the 2nd, thirty-two on the 3rd. The twenty loads left behind at Kankiu also arrived safely. Once more rations and stores were concentrated, ready for an early advance.

The Nam Tisang, a formidable river in the rainy season but now shallow and sluggish, flows through a wide flat valley to the Mali Hka. In spite of the high hills we had crossed, we were still within the basin of the western Irrawaddy and not more than 2000 feet above sea-level. It was pleasant here, though the dense mist which lay all night over the cold water made the air rather soggy. But during the rainy season few places on the Burmese frontier are more deadly than this. The whole valley is waterlogged; the damp heat and fetid stagnant air are terrible; and the myriads of leeches and biting flies make life extremely unpleasant. The scattered population is subject to the most devastating pestilence and famine. Whole villages are wiped out. In the jungle we came across a small Christian cemetery with six graves, on the little wooden crosses of which twenty names were recorded. All the deaths had occurred in the summer of 1930. About thirty per cent of the local population had perished.

On our last evening a native brought us two flying squirrels which he had found in a hollow tree. These animals are said to be rare here. We had seen no squirrels, flying or otherwise, but Cranbrook trapped some mice, and Ba Kai shot a chicken. It happened in this way. We had brought several chickens for the pot and we carried them about with us alive in bamboo baskets. One day we ordered the usual chicken curry for dinner, but the chicken escaped and sought protection by pretending to be just an ordinary chicken. It joined the flock of some twenty other chickens running around the hut. It did not attempt any clumsy disguise, but simply merged with the crowd and defied Ba Kai to identify it.

I watched him stalking it, but the wary bird had an eye on him all the time, and, just as he was about to

pounce, it made its escape. At last Ba Kai came to me rather flustered to borrow my gun. 'What for?' I asked, though I guessed that the armistice had expired. Ba Kai told me briefly, and I gave him the gun. A few minutes later I heard a loud bang. Ba Kai had shot the chicken at very close range. We ate lead curry for dinner and were picking pellets out of our teeth for days afterwards.

Our coolies were all Hkanungs, men, women and even young girls. They were willing to go not merely to the Nam Tamai, nominally four stages, but another three stages up the river to a village called Hpalalangdam. Nearly all of them did the seven stages in five days and returned in three. They made light of our boxes which a twinge of humanitarian conscience had made me keep under rather than over 60 lb. But had they been 80 lb. the Hkanung coolies would have carried them just the same, though they would have taken longer over the journey.

These Hkanungs are a simple and pleasant folk, rather timid, short and sturdy and gifted with great staying power. This is probably due to practice from childhood in carrying heavy weights. Before the British came to Hkamti Long and built Fort Hertz, they were the reservoir from which the powerful and ever ruthless Shans drew their slaves. Shan villages like Putao were full of slaves thirty years ago. But the Shans, cut off from the main body of their compatriots, were themselves, if not exactly the slaves at any rate the reluctant hosts of their more numerous and powerful neighbours, the Kachins, who lay between them and their kin below Myitkyina. For the Kachins came to stay with them when times were hard in the hills. Nor were the Shans the only people who pressed and preyed upon the Hkanungs. To the east the Chinese encroached on the Irrawaddy jungles, from beyond the Salween, and carried them off into slavery. The Tibetans from the north did the same. Harassed thus on all sides, the Hkanungs shrank deeper and deeper into their unwholesome jungles, slept at night in the trees and concealed their crops and wretched villages as best they could in the deepest valleys. Nowadays some of the men enlist in the Burma Military Police and go to Myitkyina and Bhamo and Mandalay to see the mechanized world.

At this season there was not much work on hand and the people were glad to do a little coolie labour. The women were chiefly engaged in gathering firewood from the clearings, and the men fished. The hill tribes of northern Burma catch fish in many surprising ways, trapping and poisoning them. It is not sport but work. In the Tisang river I saw fish being caught by means of a circular hand net which is flung much as the Roman *retarius* threw his net over a human victim. The sportsman waded knee deep into the river and cast his net with a peculiar flick of the wrist, so that it seemed to spin open in the air and fall flat. Between his teeth he held a short bamboo, with which he used to whack the entangled fish on the head. At Nogmung we were able to buy a good-sized fish and some sweet potatoes.

On January 3rd, sixty coolies having already gone ahead with loads and more being due to arrive that evening, we packed up, deciding to risk a start next morning even if we had to leave a few loads behind.

It had been a fine sunny day, and a beautiful evening followed. I remember there was a full moon. Its radiance was all round the village after dinner. A faint white mist was forming slowly among the stark trunks of palm trees, and the thatched roofs gave off a film of pale wood-smoke.

We were up at five the next morning. It was quite dark, and the mist lay thick over the valley. Starting at 7.30, we climbed gradually out of the mist and emerged into brilliant sunshine and warmth.

Later we met a party of five rather ragged Tibetans on the road. They came from Adung Long.

On January 5th, after crossing a pass at about 5000 feet, we descended once more into sub-tropical jungle at an altitude of less than 2000 feet, beside a small river lined with splendid trees. Then for a day and a half we climbed up towards the last pass, over the main watershed. We slept the night of the 6th in a very draughty wooden shed on the flank of the range. Ascending through the forest, where oaks, rhododendrons and magnolias mingled with birches, maples and laurels, we reached the topmost ridge and were astride the watershed between the eastern and western branches of the Irrawaddy. Two thousand feet below us flowed the Tamai river. But it was not the sight of that, welcome though it was, which excited me, nor the high ranges to the east, between which other streams flowed south to join the 'Nmai Hka. Far away in the north, over the tree tops, a range of snow-covered mountains showed up faintly against the turquoise blue sky. They could not have been more than sixty or seventy miles distant as the crow flies. It was the Tibetan frontier. Cross that, and I had solved the problem of a direct route from Burma into Tibet.

But perhaps it was more easily thought of than done. Before we could cross the range we had to *reach* it. For the first time I understood the magnitude of the task I had set myself. After all, was there any way over that barrier, which for thousands of years had protected northern Burma? It was no easy question to answer. Nevertheless we were another stage forward on the long journey, and I felt greatly encouraged.

Arrived at the river, we stumbled down the path and crossed by the cane suspension bridge to the travellers' hut on the left bank. There I had a shock. I learnt that we could not buy rice here because not even hill rice is cultivated. Our servants were out of food, having brought with them only enough for four days. I had to send a man to Hpalalangdam to bring back one of the rice bags, and we were compelled to halt for three days by the bridge.

One day I saw a Daru harpooning fish from the rocks, a native art. The harpoon consists of a bamboo about ten feet long, with four pot-hook-shaped, soft-iron hooks fitting loosely into sockets at the head. The hooks are attached to strings which are drawn together below and fastened tightly round the rod, giving each hook about six inches of free line when released from the socket. When the fisherman sees a fish within striking distance he draws back his arm, and taking careful aim, flings his harpoon into the seething water. He generally misses. If the head of the bamboo strikes, it unships the hooks, and the striker grabs at the fish by drawing his instrument through the water. It is a gaff rather than a harpoon and is not a very deadly weapon.

In the Tamai also we saw for the first time thorn-lined fish-traps. The ordinary native fish-trap is a long, tapering, conical bamboo basket with a wide mouth. This is trailed from a sluice in a bamboo dam built across the river; or a portion of the river is diverted. Fish are forced by the current into the funnel and caught in a basket attached to its lower end. But the Daru is more cunning. He lines the base of his bamboo funnel with hoops of cane, the projecting thorns of which prevent any fish which enters the funnel from escaping. Thanks to the local fishing industry, we were able to supplement the continual chicken with a fish diet.

One other instrument in use among the Hkanungs is worth describing: the so-called neck-tie hoe. It is an iron tool no larger than a trowel, shaped something like a neck-tie, bound to a short cane handle. This is used by the women for clearing the fields.

Every man of the jungle, be he Kachin, Shan or Hkanung, carries a sword or large knife in a sheath which hangs on his left side, from a loop of cane or a raw-leather strap. Only the poor Daru whose knife is smaller than theirs carries his knife by a strap round the waist. Each tribe has a different type of scabbard. Thus the Shan sword, copied by the Kachin, is a scimitar-shaped weapon, broader at the head than at the heel; and the scabbard is a flat piece of wood, actually only half a scabbard, with a few strips of bamboo strung across to keep the blade in place. The Daru knife, on the other hand, is short with a straight edge, tapering to a point at the end. The Kachin carries his weapon next to his body, with the scabbard on the outside and the edge uppermost. Thus, on drawing, he must grip the handle from underneath in order to bring the edge downwards. The Daru, on the contrary, carries his weapon with the scabbard next his person and the knife outside, edge downwards. On drawing, his hand must grip from above in order to bring the edge downwards. The Mishmi tribe of the Assam frontier do the same.

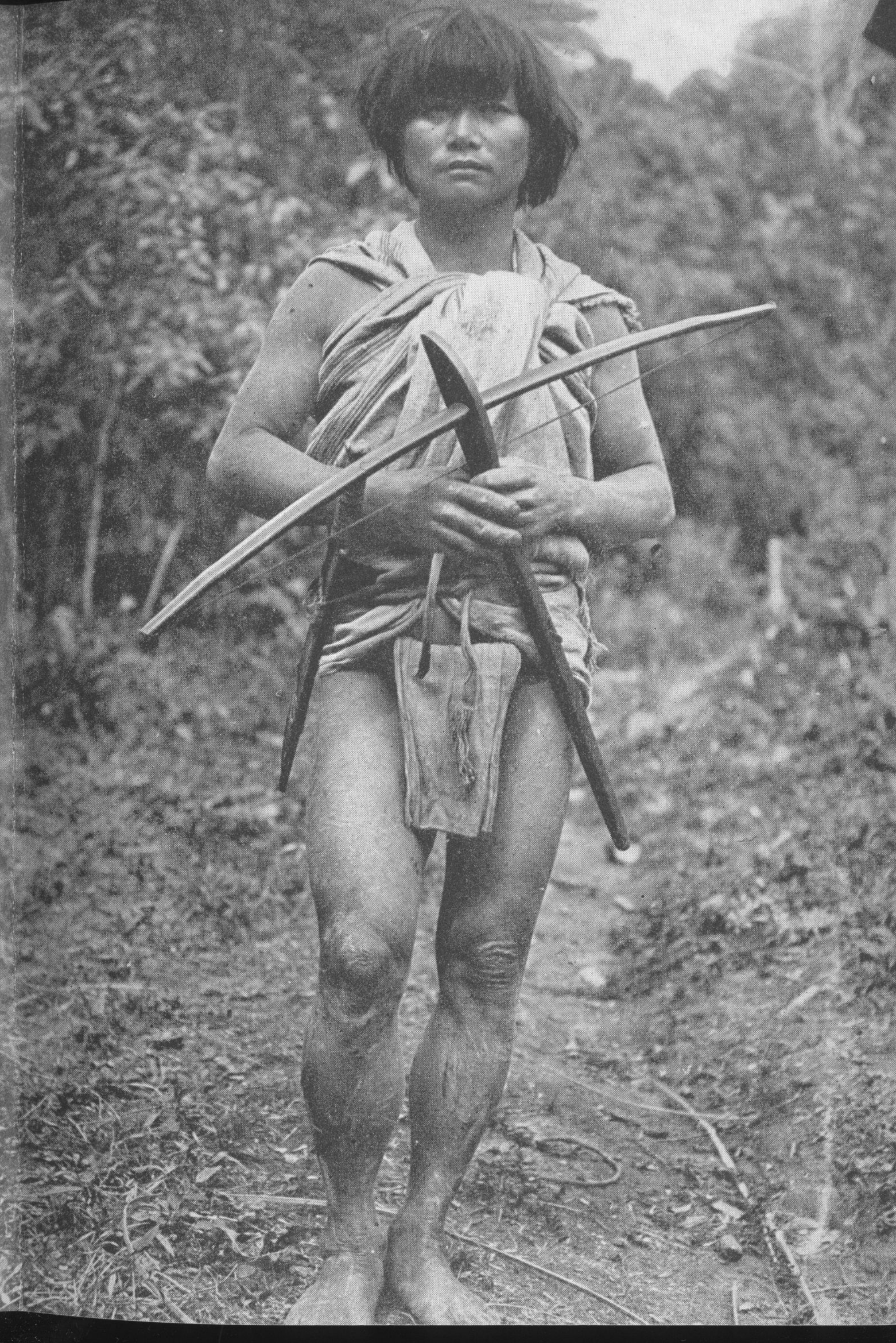
An almost universal weapon on the frontier is the crossbow. The string is usually made of bamboo, and bamboo arrows are used, the points hardened by fire and poisoned with aconite root. The average span is about two feet, but bows of a five-feet span are sometimes seen. Boys often make long-bows of split bamboo, using mud pellets for ammunition, but these are only toys.

Our weapons aroused great interest amongst a people who kill almost every living thing they see. Fish, frogs, snakes, rats and birds all furnish food to the famished Darus; they were even grateful for the carcasses of our skinned mice. The mouse-traps received a great deal of attention. Like children the Darus set to work joyfully to catch rats for us, but asked us to let them keep the corpses. They brought us the first specimens we had seen of the giant rat.

On January 11th we started up the Nam Tamai. The fine weather broke, and it rained for three days, making the path very slippery. All the huts leaked; and it was almost as wet inside as outside.

The monsoon lands including Burma which border

[*facing:* A DARU HUNTER



the east Indian Ocean enjoy six months' almost continuous fine weather in winter and spring. But this does not apply to the hill country of far northern Burma. The lofty region near the sources of the Irrawaddy is governed by a very modified monsoon climate. Consequently one learns to expect rain at any time.

On January 12th, a typical Burma frontier day, the clouds low, the forest forlorn, I found the first rhododendron in bloom, the fragrant white-flowered *R. dendricola*, 'dweller in the trees'. Here it was not dwelling in the trees, but on a great rock in the open river bed, at an altitude of 4000 feet above sea-level. Yet it would not be hardy in England, for it is quite unaccustomed to frost. This small, leathery-leafed shrub often does grow high up in the tree tops, and at altitudes considerably above 4000 feet; but since it can achieve the same end, namely push itself into the light, by growing on rocks and cliffs, it is quite prepared to accept such vacant lodging. It is an epiphyte (not, be it remarked, a parasite). The saturated atmosphere enables a considerable epiphytic flora to thrive here, and every big tree is burdened with a wealth of epiphytes such as rhododendron, *vaccinium*, *pentapterygium* and ferns.

The Nam Tamai is a magnificent mountain river, unfordable anywhere at any season, and unnavigable even for dugouts, being swift and turbulent. The gradient averages about twenty-five feet a mile hereabouts, but it increases rapidly farther north. At the Hpalalangdam suspension-bridge the river is about thirty yards wide. But this is not the main branch of the eastern Irrawaddy. Twelve miles downstream it joins the much bigger Taron, which is the main stream, the combined rivers (together with two much smaller rivers, called Tazu and Dablu, which join in close by) forming the 'Nmai Hka. Following up the Tamai, we enjoyed the most beautiful scenery both up and down the valley. Rapids alternate with tranquil pools of great depth where the water, pressed between smooth rock walls, looks like green ice. The water is cold but there are plenty of fish in the Nam Tamai. The mountain-sides are everywhere steep and often precipitous. The valley becomes more and more of a gorge as we go north. And the scanty population is confined to the narrow river terraces at the bottom of the valley.

Sin (the raw lad engaged at Fort Hertz) was all this time eating his way much too heartily into our rations. He was wasteful. He was lazy. I scolded him. Ba Kai scolded him. On January 13th Ba Kai rated him soundly for lying abed in the morning, whereupon Sin took himself off and we saw him no more. We certainly did not miss him. The same day we reached Hpalalangdam, wet and miserable, to find all our loads from Nogmung safely arrived and stowed in the rest hut.

There was not a sign of a village anywhere. For miles up and down stream even the main valley seemed to be empty. Yet our arrival was known, and next day men and women appeared from heaven knows where, curious to catch a glimpse of us. Their huts are well-hidden in the jungle.

It is easy to make friends with the Hkanungs. Shy at first, they soon give you their confidence, and like nice children they will do anything for you. That evening

they brought us a large lump of something rather like suet. Nobody would have guessed it to be sago. But it was. When heated it formed the familiar glutinous stuff one was made to swallow in the nursery. A crust had formed over this sample; only its novelty made it edible. The sago palm is not common in the Tamai valley and does not extend beyond Hpalalangdam. But it is abundant farther south. The tree which had been felled to yield this morsel — for the sago is obtained from the pith of the trunk — was thirteen inches in diameter near the base.

Close on our heels came a barefooted messenger from Fort Hertz. He wore khaki shorts and shirt and round his close-cropped head a scarlet pugaree cloth was bound. Just below his bare knees he wore black rings of cane, of the thickness of coarse cotton. He saluted me and handed me an official-looking envelope. O.H.M.S. I feared the worst. We must not go to the Adung valley: it had been presented to Tibet. Or perhaps the people were dangerous savages, and our safety was in the balance. I tore open the envelope. It contained an official form from the Police Department, Calcutta, headed Form 205 — A (a). It read: 'Kindly reply to my OP/2645 of 29/xi/30', and bore an illegible signature.

CHAPTER VI

NATIVE CUSTOMS OF THE DARUS

THE halt at Hpalalangdam gave me an opportunity to appraise the forests of the Tamai valley. Though the river flows at an altitude of only 4000 feet, the mountains on either side attain a height of over 12,000 feet within eight miles. The average slope, however, is nearly 70 degrees, considerably higher than the figures indicate, because the mountains rise tier on tier. Add to this the fact that they are covered with impenetrable forest, and it is easy to understand how inaccessible the high ranges really are.

The first thing I noticed was that the near ridge, about a thousand feet above the river, was fringed with pines. It looked in silhouette like the blue Himalayan pine (*Pinus excelsa*), and such it proved to be when, after some difficulty, I reached the lowest trees. These were saplings not more than ten feet high, with needles nine inches long. I had to climb another 1000 feet before reaching full-grown trees, and even then they bore no cones.

Up to about 5000 feet the hill-jungle had the appearance, though not the composition, of sub-tropical evergreen forest, like the forests south of Fort Hertz. The bigger trees were muffled under a swarming, struggling growth of creepers and epiphytes. Tree ferns and climbing palms (rattans) were common, though

belonging to few species. Erect palms, however, are rare. I saw only an occasional sago palm. A stemless and spiny *Phoenix* was more abundant. There were only two species of rhododendron, the white-flowered *R. dendricola* and, on the rocks by the river, the crimson-flowered *R. indicum*. Throughout the hill-jungle the heath family, so abundant at higher altitudes, are almost entirely replaced by the closely allied *Vacciniaceae*: and they are all epiphytes, *Agapetes*, *Pentapterygium*, *Desmogyne* and *Vaccinium* itself. They are vivid little bushes.

The mixture of tropical and northern plants in the Tamai valley was very evident. The northern flora had been driven south by glaciers advancing from Tibet during the last glacial epoch, and after the retreat of the ice the tropical flora had crept up the valleys from the south as the rivers deepened and widened them, letting in the warm moist monsoon current. The net result has been a curious overlapping. The northern flora has invaded the tropics fanwise by way of the high ranges, which spread out like the fingers of a hand, the tropical flora advancing steadily northwards up the valleys. More than that, the intricate mountain and river pattern has resulted in an archipelago of little floristic islands, a tropical valley here, a temperate mountain there, cut off and surrounded by a rival flora. Thus isolated into little self-contained communities the flora has evolved many endemic species.

Cranbrook was as successful among birds and beasts as I was among the flowers. He trapped rats and shrews and shot a red-headed trogon. And from the natives he bought a number of skins of the rare water-shrew, *Chimarrogale styani*, and the giant *Nectogale sikkimensis*. The Darus chased a barking deer into the river, captured it alive and sold it to us for food. They also brought us two giant mole-rats, alive. These creatures, weighing a pound each, live underground, and the natives dig them out. We found some of their burrows in the forest. Then Cranbrook made a fishing-rod and started fishing. He did not catch any fish, but we bought several. Sometimes I indulged in a little trapping, and one day I trapped a brilliant green magpie in a rat-trap which I set by a stream in the forest. The trap had been baited with cheese and was placed on a sand spit close to the water in the hope of catching a water-shrew.

On January 15th the weather cleared up again, and the sun shone brilliantly. We had a fine view of snow-covered peaks to the north, and there was snow on the trees, about 3000 feet above the river. The last storm had done its work, sealing all passes over 12,000 feet till June.

While exploring in the jungle I came on a hidden forge where iron ore is smelted and made into knives. There was a small mud fire-place and chimney with bamboo pipes for creating a draught by blowing. Charcoal was scattered around but there was no blacksmith. The anvil was of stone.

Nor was this forge the only indirect evidence of the presence of man. I also found a grave or, strictly speaking, a lying-in-state. The Darus burn their dead. The ashes then lie in state for a longer or shorter period while the relatives await a favourable, that is to say a financially favourable opportunity for interment. The actual

interment is the occasion of a feast to the neighbours, an orgy. It is the burying, not the cremation, which is the big ceremony. Nearly all the cases which come up before the Bench result from funeral quarrels. The others are matrimonial disputes, though the Darus are not a litigious tribe. During the obsequies, food and drink are plentiful and free. A buffalo or a mithan, valued at anything from fifty to a hundred rupees, is slain. Tubs of fermenting corn are tapped. A wealthy man will have a most sumptuous *nat galore* to prove that he is wealthy, as well as to pacify the *nats* (spirits). When it is all over, he is probably in debt for life, though no doubt he considers it was worth it. But inevitably there are other kinds of debts against him, and he soon finds himself involved in blood-feuds, which under the British Indian Government are now converted into mere law-suits. He is both debtor and creditor, the 'debts' arising in various ways. Some people he forgot to invite are offended, and have a 'debt' against him. On the other hand those invited who failed to come had better keep out of his way, for he has a 'debt' against them. And during the feast he is sure to have offended somebody, either by not giving them enough to drink or by giving them too much, so that they went away with a pain, or fell into the river or trod on a bamboo spike.

As for the matrimonial quarrels, they are mainly concerned with betrothals. Once safely paired off, the Darus seem to get on tolerably well. A girl is a valuable asset to her parents. She can be bartered for one or two mithan, several gongs and cooking pots, or a gun and a knife. One case I heard of which came up before the

Bench concerned two men and a maid. A man named Muk bought the girl for five mithan — an expensive girl — on the instalment system. The payments were considerably deferred, and the husband, instead of taking the girl, his legal wife, to his house, as he had every right to do, as soon as the first instalment was paid, deferred her also. At last he paid the final instalment, and she went to his house. A month later she gave birth to a son. Her husband thereupon demanded repayment in full, to wit five mithan from one Glok Hsun her lover. Glok Hsun demurred and promised one mithan. After arguments had been heard, Muk agreed. Later Glok Hsun repented his offer and refused to pay even one mithan, whereupon Muk sued him before the village elders, who gave a decision in favour of Glok Hsun. On appeal, this decision was upheld by the Bench on the ground that until the girl actually went to the husband's hut he had not legally married her and she might sleep with whom she liked. He could have taken her, had he wished to do so, as soon as the purchase price was fixed, even though the instalments were in arrears. It was his own fault for not doing so.

The lying-in-state was a poor affair. The charred bones of the deceased were contained in a small wooden sarcophagus, on the lid of which a face was roughly carved. The sarcophagus was supported on a little platform beneath a thatched roof from which hung the cross-bow, arrow-case and cloth bag of the deceased. On the platform by the sarcophagus were laid the horns of takin and serow. So it was the remains of a man, a hunter. Evidently the cross-bow was for the use of his

spirit. But what was the significance of the horns? Were they consolatory? Planted around the platform were five tall bamboo poles, each surmounted by a wooden bird in flight. They hovered here to carry away with them the volatile spirit of man. Or perhaps the bird symbolized the spirit itself.

During the first five days of our halt, many coolies arrived to carry our loads, and twenty-seven went on northwards to the Seinghku confluence, loaded with bags of rice and boxes of stores. Yet we saw no huts. For these we should have had to follow one of the narrow paths into the jungle for a mile or more, up the outer tier of hills.

Returning to the hut from a walk one day, I found our first mail had arrived from Fort Hertz. There was also a note from Leedham, saying that he was coming to Hpalalangdam and would arrive there on the 20th. So on the morning of the 20th we were ready for him. He arrived in due course with his mules and followers and the sub-assistant surgeon, a native of India who had come to vaccinate the Hkanung babies. In the previous year small-pox, a disease common in China and Tibet, had swept down the Tamai valley from the north as far as Hpalalangdam where, thanks to a campaign of vaccination carried out from Fort Hertz, its progress had been stopped. Now the Hkanung mothers flocked to Hpalalangdam with their offspring and the sub-assistant surgeon spent a busy day. The babies made surprisingly little fuss; evidently they are stoical from birth. Leedham had come in his magisterial capacity to sit on the Bench, and the valley, hitherto almost deserted, became alive.

Headmen appeared from remote and obscure villages with presents of eggs and fowls and tribute. A hut tax of one rupee a year is levied by the Government in this distant region. Messengers came and went. I counted nearly fifty men, women and children there next morning — no doubt due to the fact that Leedham was paying out gratuities for the upkeep of roads and bridges. The magistrate issued orders to headmen for good behaviour, including assistance to us, and took the Bench. After trying a case he went away saying he would be back again in a year and the crowds departed.

Amongst the headmen who came from afar to see Leedham was my old friend Anu, a Tibetan from Haita in the Seingkhu valley. I had stayed with him for six months in 1926; and when he learnt that we were bound for the Adung valley he begged us to go to Haita instead. Anu was a middle-aged man with dark smiling eyes, a brick-red face crinkled like a dried apple, and an ingratiating manner. When he laughed, you saw that he had only a few fangs left in his gums. He complained to Leedham that his village the previous year had had to send representatives to Rima in Zayul, to acknowledge the overlordship of the magistrate and to pay tribute; and this although Rima is on the other side of the range, which here forms the frontier *de jure* between Burma and Tibet. Anu said that if they refused to pay tribute the Rima magistrate would send over men to pillage them, though there was no evidence that he had ever done so. But perhaps Haita had never yet refused to pay tribute to Rima since the people first went there, which would seem to justify Rima in continuing to demand it.

Unfortunately it is no longer possible to settle these trivial disputes on the spot, and the ponderous machinery of government is brought into play. But in fact governments settle nothing in such cases. Supposing that after months, or more likely years of negotiation two governments such as the Indian and Tibetan Governments, radically different in principle and unequal in weight, do agree theoretically on a frontier, yet nobody on the spot pays the slightest attention to the ruling or even hears of it. Like the light of a new star, the message takes years to reach its distant objective. These things are settled by custom, not law. Moreover, the Tibetan Government has no maps and is therefore unable to understand a map. Even educated Tibetans are inclined to regard a map as a magical instrument by means of which you can tell how far it is from A to B even though you have never been to A or B yourself. A frontier laid down in a map in Calcutta may be agreed to by a Tibetan delegate as the price of his leaving Calcutta, but it is not likely to worry the people on the frontier, who know that everything will go on just the same. Moreover, the Rima magistrate quite appreciates that some of his adult male population crossed the mountains solely in order to escape taxation. The fact that they are Tibetans is much more significant than the fact that they have crossed the frontier.

Of course if only one party to a frontier dispute, in this case the Burma Government, can make maps, it will make them and proceed to lay down the frontier most convenient to itself. This is exactly what the Burma Government did; but to have its action accepted by the local inhabitants necessitates administering the country right up to the frontier and protecting the people on the Burma side, by force if necessary. This is a big commitment for a place so remote from headquarters as the Seinghku valley and the yet more remote Adung valley. Both valleys at present lie outside the administrative frontier and the Assistant Political Officer is not allowed to cross 'the line'.

Leedham left us on the 22nd, returning to Fort Hertz. Most of our loads were now on their way to the Seinghku confluence, and we only awaited another dozen coolies in order to be able to proceed ourselves. They turned up that evening, and we started again, on the 23rd.

Gradually the forest began to change as the climate grew cooler. Deciduous trees became more plentiful. Pine trees appeared nearer the river and even the Hkanung huts were now thatched with grass instead of with palm leaves.

The valley narrowed and we had repeatedly to cross and recross the river to avoid cliffs. Three times above Hpalalangdam we crossed by cane suspension-bridges, but the bridle path continued quite good. On the second day we met some people, which was quite an event here. A Chinaman had married a Hkanung woman, and we met the whole family. Some of the Chinese pedlars from the Salween, who tour this country selling salt, cotton cloth, yarn, needles and such things, marry Hkanungs and settle down. Yet it was Tibetan rather than Chinese influence we found here. The people wear woollen instead of thin cotton clothes, and both men and women possess Tibetan silver jewellery, set with coral and

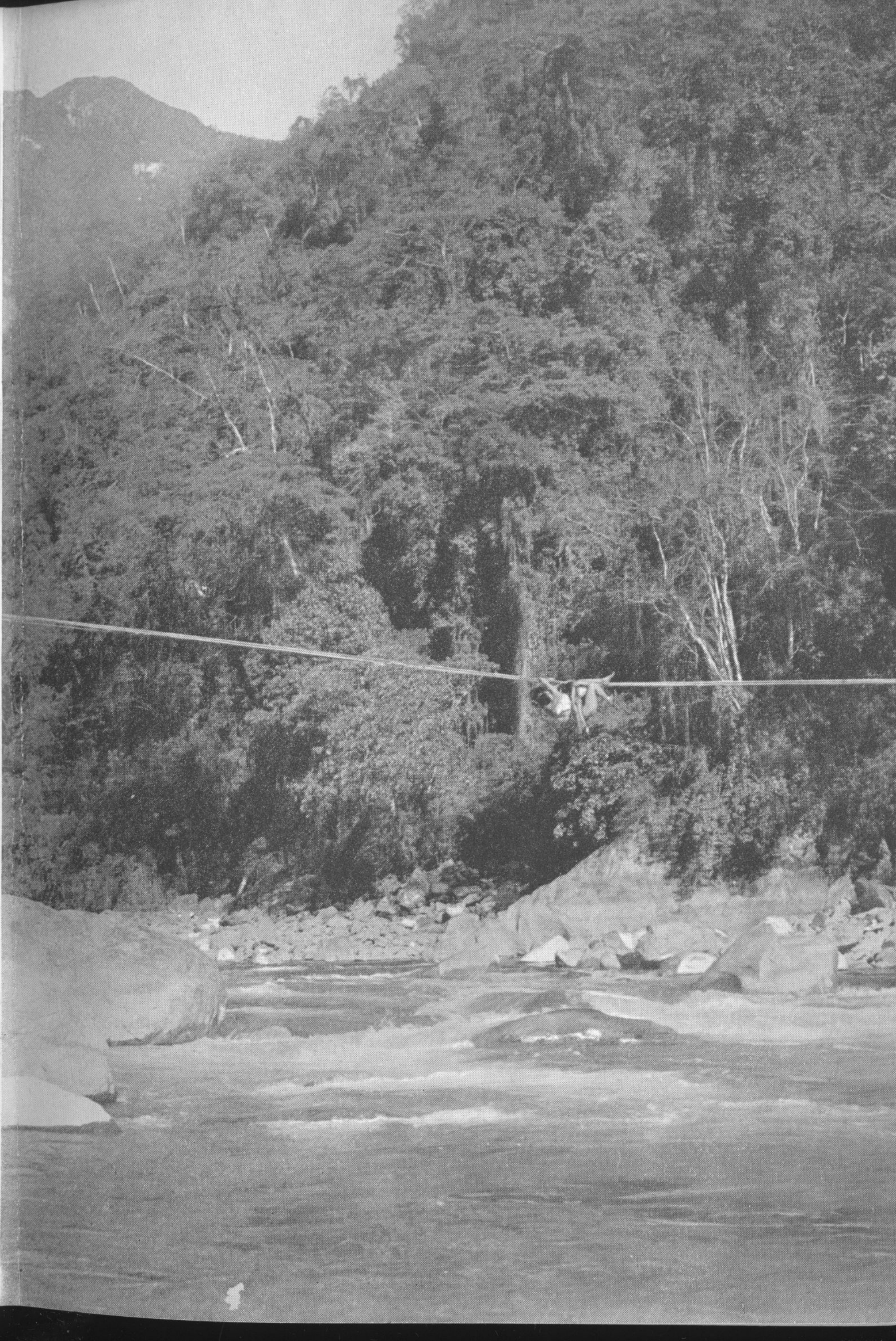
turquoise. Girls usually wear bamboo tubes in their ear-lobes about three inches long and an inch in diameter. These are not merely ornamental but useful. One end of the tube is plugged, and into the cavity are thrust all the gew-gaws valued by the Hkanung maid, that is to say, odd beads, needle and thread, a slice of betel-nut, or a leaf of tobacco. The ear-tube is in fact the Hkanung vanity bag, though it contains neither mirror nor lipstick. Nor do the Hkanung belles powder their noses; instead they tattoo their faces. Sometimes the pattern consists of a few poetic lines, sometimes of a mere variety of dots and dashes. Every girl carries a small bamboo comb hanging from her girdle, and often a bamboo 'jews' harp' which she twangs in the evening while seated round the fire.

On January 25th, a sunless day with a drizzle of rain in the evening, we reached the confluence of the Seinghku and Adung rivers. The ridge which divides them ends in a bold gable fringed with pine trees, and from either side the two rivers rush together; but the Adung instantly swallows the little Seinghku, whose roar is drowned in the mightier roar of the Tamai, as the combined river is called. Immediately below the confluence is a series of cataracts where fountains of foam seethe and fret amongst huge granite boulders, marvellously sculptured. Indeed I thought one might see similar designs hewn out of stone in almost any Bond Street gallery, for the style was futurist. I amused myself picturing how this haggard-looking rock might have stood on a pedestal labelled 'Resolve', while that tortured-looking one might be called 'Temptation', a third, 'Despair'. A few perhaps might be nameless and void. It was a pleasant game. By the next day I was confused, and 'Despair' had become 'Resolve', I think.

The hut, which leaked more than most, stood on the right bank of the Tamai, a quarter of a mile below the Seinghku, which is spanned by a cane suspension-bridge. This bridge writhed and bucked like an unbroken horse when you mounted it, and here ended the mule road. The track to Haita leads up the left bank of the Seinghku, that to Adung Long up the right bank of the Adung.

Just below the hut a monkey-rope bridge spanned the broad Tamai. It consisted of a few thin canes, fastened to tree trunks on either bank. A large cane ring is threaded on the ropes, and inside this the little Hkanungs fit their bodies and haul themselves across the river. It is hard labour which those who are accustomed to softer living find difficult as well as uncomfortable.

The next morning two men presented themselves at the door of our one-roomed bamboo hut with a flowing bowl of fresh milk. They were not Hkanungs but unmistakably Tibetans, and they put out their tongues quite politely. Tibetans settled in the jungle! I looked outside and found the whole terrace at the foot of Great Gable, which four years earlier had been covered with thick jungle, cleared and planted and fenced. Cattle, and thin humped kine of India and goats were grazing there, and a log hut thatched with grass had been built. The altitude of this built-up area was a little over 4000 feet. Would the southward moving Tibetans eventually conquer the Irrawaddy jungle, or would they in turn be



[*facing:* A ROPE BRIDGE OVER THE ADUNG RIVER conquered by it? In the neighbouring province of Zayul, over the mountains behind the snow range, there are Tibetan villages along the Lohit river, at 4000 feet altitude. Rima itself stands not much higher. But the climate is drier and the winter sharper. The Lohit valley, from Rima northwards, is so arid that only pine trees (*Pinus Khasia*, not *P. excelsa*) grow on the cliffs. And these pioneer Tibetans, who it seems had been pushed out of Haita by public opinion (for what offence we did not discover), had taken to herding Indian cattle. Yak would quickly perish in the jungle but it is possible that a waterproof hybrid might eventually be evolved.

Our fuel was mostly driftwood from the river. This was easily obtained. One kind which constantly recurred gave out an offensive odour when ignited; another with a very close grain was remarkable for its great weight. I was curious to know what these timbers were, but except that I knew they came from higher up the Adung and were probably trees of the temperate forest the problem baffled me.

You cannot see far up the Adung valley. As I watched the deep river flashing like a sword from its scabbard of hills, I tingled with excitement. Ahead lay the unknown. Mystery and the beauty of flowers beckoned me on.

CHAPTER VII

LAND OF THE RHODODENDRON

So at last we had reached the parting of the ways; the confluence of the shrill-voiced Seinghku river from the northwest and the deep and silent Adung river from the north. The Seinghku river is only twenty-five miles long. In 1926 I had reached the alps in four days by this route, and the Diphuk La, which is 14,500 feet high, in five. But the Adung river was far larger and longer.

We had left Myitkyina just eight weeks ago, since when we had travelled 350 miles by the bridle path. Inevitably, the further we penetrated into the Irrawaddy jungle, the slower our progress became, not only because the path became worse, but also because of the increasing difficult problem of transport in this uninhabited region.

We spent a week at the confluence. As usual we could see no huts, but there were villages on both sides of the river hidden in the jungle, and the villagers sent some of their number daily to draw water and carry firewood for us. Only the Tibetans lived out in the open. No doubt the reason why the Hkanungs had never cultivated this acre at the confluence was that it was too tempting to the hill raiders. This Tibetan family appeared to be squeezing blood from stones. A spring crop of barley was coming through the gravel. Later maize would be planted. There were a dozen head of cattle, besides goats. Every day the cattle were driven a short distance

up the Seinghku valley to feed on the rank herbaceous growth of the forest. They looked very miserable, but that may have been for lack of salt. They yielded excellent milk, and we got a bowlful every day. The goats looked sturdier than the cattle and were certainly more frisky. We tried in vain to buy one.

It rained steadily for three days, pouring outside in the forest and dripping inside in the hut. We settled down to a long wait with such patience as we could muster. It was impossible for us to move until the rain ceased, so difficult was the path; but meanwhile men were making the worst places passable and building huts for us at each stage. The Hkanungs were always helpful, and when we told them to get us zoological specimens they set to work with zest. We offered to lend them traps, but discovered that they were far more successful when left to their own devices.

Barter proved more popular than cash payment. Money was useless to the Hkanungs unless they went to Fort Hertz to spend it. The scale of values was in this order: (1) salt, (2) beads, (3) red or black yarn, (4) needles and buttons, (5) currency. Empty tins and, still more, bottles were always acceptable, but as their value rose rapidly farther north, we were chary of parting with them at present. Salt is an absolute necessity to human life, probably to all forms of life, and, since it is one of the most difficult things to procure in the jungle, the Hkanungs put a high value on it. We had brought a good supply, knowing that it would purchase almost anything. Small opaque beads, preferably red or white, had a certain value as ornaments amongst the women.

All Hkanung girls wear bead necklaces when they can get them. Even white shirt buttons find a ready market. Cranbrook and I were always missing buttons off our shirts, and we suspected Ba Kai, quite unjustly, of doing trade in them. But the Hkanungs are much too poor to be loaded with bead necklaces like some other of the frontier tribes: many a girl had to be content with a single string or none at all.

During the rainy season it felt miserably cold, because it was so damp. Despite the nearness of the snow — and this was the coldest time of year — frost is unknown. The minimum temperature never dropped below 40° Fahrenheit, but sometimes the maximum did not reach 50°. Though the Adung river is 250 miles north of the tropic, and 4000 feet above sea-level, the perpetually humid atmosphere, great summer heat accompanied by heavy rain and complete absence of frost, encourages sub-tropical forest. Many big trees, festooned with climbing plants and covered with epiphytes such as the bird's nest fern, grow at the bottom of the gorge, and the undergrowth is impenetrable.

The rain ceased. A party of Darus arrived, and we sent them up the valley with boxes of stores, tents, and equipment. They were the wildest and most uncouth-looking tribe I had ever seen in Upper Burma. The men were naked except for a belt composed of a number of cane rings about the thickness of packing thread round the waist, over which was draped a small square of cotton cloth, and a blanket round the shoulders against the cold. Every man wore a short hunting-knife in a half-sheath of wood supported by a string round the waist. Most of

them carried cross-bows. The shock of hair was long and unkempt, but trimmed all round the head. Women and girls wore short skirts and a blanket wrapped round the body. They all smoked pipes incessantly, but did not chew pan like the down-river tribes. Their teeth, though not discoloured by pan, were foully dirty, probably owing to the miscellaneous zoological diet in which they indulge.

The Darus of the Adung valley, the last tribe in Burma, are pygmies and until recently dwellers in trees. The men average about fifty-six inches in height, the women two or three inches less, but they are sturdily built. The curious point is that these pygmies are not Negritos but quite definitely Mongoloid. Their shortness of stature may be due in part to starvation diet, or to lack of salt or to other physiological causes which could be remedied. But men (not women) over five feet high are common enough to need explanation, and there can be no doubt that the Darus are a very mixed tribe. Nevertheless here was definite proof that there exists, in the depths of the mountain forests, a pygmy Mongoloid tribe.

The Darus are a vanishing race, doomed to extinction. Wild men need protection when encroached on by a higher civilization, just as wild birds and wild animals do, and the Darus are not protected. Not that anyone wishes to exterminate them, but everyone wishes to exploit them, and they cannot defend themselves. So they will perish. Call them, if you will, one of Nature's unsuccessful experiments; but Nature has allowed them to survive for a time in a region where no man survives for long. Encompassed on all sides by more powerful tribes, driven relentlessly deeper and deeper into the slums of the jungle, the Darus must presently fade into the *Ewigkeit*, vanish away as though they had never been. They have bored their way into the heart of the mountains, and they can go no farther. There at present they survive, in isolation, regularly venturing forth on their own initiative, but on the whole ignored, neglected and perhaps contented.

At last, on February 1st, a large contingent of Darus arrived to take us through the gorge and we made immediate preparations to start next day. Even so we had to leave some of the loads behind to be brought on later. This led to a pilfering case. But I was so eager to push on up the Adung as far as we could while the year was yet young that I did not stay for it. The Adung had long been the goal of my ambitions. We were on the threshold of the promised land.

The first day's march was long and tiring, and when we halted after seven hours we had only covered five miles. Most of the time we were in the jungle, but occasionally we were tearing our boots to pieces amongst the boulders in the river-bed itself. Next day the weather was finer and the march more interesting. We enjoyed the spring-like tang in the air. A bird with a voice like an English blackbird sang in the high grass, and in the evening bats flapped overhead. It was the last fine day we were to enjoy for some time.

Though we again saw no human habitation, we crossed a cultivated slope where barley and peas were coming up. This gave me the feeling that our coming was known and marked, that we were seen by invisible eyes. But now

the going became more difficult. At one point where a stream plunged down the cliff there had been a wash out. The surface skin had been scaled from the rock, exposing a smooth, bare slope of more than sixty degrees. Across this face we had to make our way. A slip would have been disastrous. Very timidly we crossed one by one, straddling from ledge to ledge. I was less scared for myself than for the coolies. Every minute I expected to see one of them overbalance and roll down to the river, 300 feet below. But they proved as agile as monkeys, and even the women, after putting down their loads for the men to carry, crossed safely.

In another place we had to climb an almost vertical shaft in the rocks for hundreds of feet. The forest here was very fine, some of the trees being of tremendous size. From the summit of the cliff we were able to look down on their crowns. Scattered but not rare was the huge deciduous tree *Wightia gigantea* which sometimes supports itself by clasping some luckless host with aerial roots. It is not, however, a parasite, but an epiphyte, a distinction which the unfortunate host cannot appreciate. The weight of the rapidly growing Wightia soon crushes it to death. Here, though, *Wightia gigantea* was probably standing on its own roots, without extraneous support, as it frequently does in Assam. On our return journey in November, I picked up the fallen purple flowers, like little pinched plum-coloured foxgloves. The Wightia is recorded as an evergreen tree, but it is certainly deciduous in northern Burma, and also in Assam. It flowers in the winter, when bare of leaves.

February 4th was a significant day. Starting immediately after breakfast, we soon reached Adung Long, a village of six huts, and camped on the bracken-covered terrace, at an altitude of 5000 feet. There were more pine trees here; the valley widened out; and in the dense thickets which lined the river grew several rhododendron bushes. One of these was in flower. Though only eight feet high and about ten years old, it already bore two large hemispherical trusses of rosy-purple flowers, each flower three inches long. The big leaves, eighteen inches long by nine inches wide, gave an air of quality to the plant, and, not recognizing it, I named it then and there *Rhododendron magnificum.* It is closely related to *R. protistum*, a Chinese species. Another big-leafed rhododendron (*R. Kyawi*) which grew on the river bank was not in flower, and indeed I never saw it in flower either here or farther north, though it was not rare. At any rate I was now in the land of the rhododendron. Henceforth there would be more and more of these superb plants.

The fine winter weather was now over; the spring rains and snow had begun. All day the clouds drifted up towards the alps to condense further and descend in a permanent wave.

Then came our last march. The path lay round the shoulder of a mountain through high grass and bracken where the forest had been burnt, then in the river bed, then across a deep ravine filled with untouched forest. We had still 1000 feet to climb before we reached our destination, and it was hard going. As we ascended, the valley widened. Suddenly we turned a corner and a great white wall rose in front of us to a height of over

14,000 feet. We had been nearly ten weeks on the road from the railhead in Upper Burma before the alps were in sight. But now that at last they were, how worth the time and pains! For a while I gazed in silence, strangely disturbed by the splendour of the sight, trying to picture what lay *behind* those sleeping mountains. Then I turned my attention to nearer objects. Close beside me stood a big tree lathered with ivory-white blossom like a magnolia. It was *Michelia doltsopa.* Later I found it abundant along both banks of the river at a height of 6000 feet, and in the forest it is found at nearly 8000 feet. Despite the most ruinous weather, it continued to flower throughout February and March when there were few trees except rhododendrons in bloom. Some of the biggest specimens, sixty or seventy feet high, with a fine crown of branches, were foaming with blossom at the end of March, and on the few sunny days presented a bewitching appearance. The flowers are borne in serial ranks amongst the rusty, part-worn foliage of the previous year, which in March and April is being rapidly shed to make way for the new: so that in the Adung valley, *Michelia doltsopa* is, but barely, evergreen.

Another plant, still in bloom but passing into puffs of silvery, airy fruits, was *Clematis napaulensis.* It hung in massive folds of green foliage from one of the largest trees, its creamy flowers with jets of purple stamens almost lost among such sumptuous drapery. It is an exuberant climber, but scarcely hardy in Britain.

The Adung river was still a roaring torrent. We crossed it by a cane suspension-bridge, climbed a hillock; and the roar of raging waters ceased. Immediately below us the valley widened suddenly for half a mile, and the slope decreased. On either side the mountains reared up steeply for many thousands of feet; full in front, blocking the valley, was the snow-covered wall we had already seen; and from a crack in it the river emerged, to flow into this narrow basin. It left the basin, just below the bridge, with a roar, but for half a mile it flowed almost tranquilly. I was not particularly interested in the river, or even the mountains, at the moment. The Daru coolies had set down their loads. Below us lay fenced fields, with three small huts standing apart. It was Tahawndam, the last village in Burma.

CHAPTER VIII

THE LAST VILLAGE IN BURMA

So we came to the Tibetan outpost of Tahawndam. Prayer flags fluttered from a cluster of poles, and a thin spiral of smoke ascended from a pyre on which juniper branches had been ignited in our honour. I looked about me. Here and there blue pines towered above smaller trees, their powerful tawny boles contrasting harshly with their slender needles. Crimson-flowered rhododendrons (*R. magnificum*), with enormous leaves, glowed in the thickets, and there were other fat-budded rhododendrons, not yet in bloom.

Now my attention was diverted by a deputation of the local inhabitants who with tongues stuck out and hands extended, palm upwards, to show that they neither concealed a weapon nor meditated any treachery, came to meet us. At the head of them was the Tibetan headman Tsering, a bony fellow, tall compared with the little Darus. He had a big nose and a very untidy pigtail like that of a Jack Tar of Nelson's days, and he greeted us with a lop-sided smile, snatching a greasy felt hat from his disordered hair. Only his body was warmly clad in the foxy red skins of goral; otherwise he was almost as naked as the Darus. Every few minutes he scratched himself thoughtfully, as though bearing no malice towards what was irritating his skin. With him was the village priest, a benign-looking old man, with a wrinkled face and a straggling beard, dressed in a tattered red gown and yellow sheepskin cap. He might have been a country parson in reduced circumstances. There was also a loose-limbed, horse-faced fellow with ruminant teeth which he displayed in a seraphic smile. We called him George.

Thus escorted by the elders, and by the proud but diminutive Daru headman of Adung Long, carrying a cross-bow almost as big as himself, we walked past the village perched on a terrace to where a stout log-house thatched with grass stood on the river bank. It was our base camp. The hut was partially divided into two rooms, one for Cranbrook and one for myself; the dividing wall did not reach the roof. Each room had its own door. Mine looked out over the river, Cranbrook's over the mountains. I inspected our new home with interest, from the earth floor to the low log bedstead in the corner. Luckily we had provided ourselves with camp beds. We blocked up the communicating passage between the rooms and hung waterproof canvas sheets over the partition. For both our sakes I insisted on some degree of privacy: we were going to see quite enough of each other before we got back. Later on we needed the waterproof sheets for the roof. Our camp table was arranged in Cranbrook's room, where we had our meals, the kitchen being on that side of the house. The servants' quarters were mere grass huts, but they were warm and kept out the rain. I sometimes wondered how Ba Kai managed to cook, lying on his stomach.

While we were settling in with such luggage as we had brought with us, there arrived a procession of Daru

women and girls bringing bundles of thatching grass and firewood, for us; and their Tibetan lords brought us chickens, eggs and milk. There were plenty of cattle about. Our next visitors were a collection of Tibetan women. They had clean faces with an olive complexion and rosy cheeks. Tsering's daughter, the village beauty, a buxom lass of twenty, was almost good-looking; but she had no figure. She was sack-like. She had smoothed down her sleek black hair with butter, put on her cloth boots with the scarlet and green trimming (most of the Tibetans went about barefoot), and she wore her best *chupa*, a chocolate-coloured garment like a dressing-gown, which she pulled around her ample body and tied at the waist. She also wore all her jewellery, bead necklaces, metal ear-rings and the silver finger-rings with the turquoise and coral stones in them which Tibetan women very much admire. They said they had come to see us, but I suspected that they had come to be seen.

The Tibetan quarter of Tahawndam consisted of four log cabins 'and the usual offices', thatched with grass. Each hut comprised a single room, very dark, lit only by the narrow beams which filtered through the log walls, and a single door. Inside was a fire-place, but no furniture, not even a bedstead. People slept on the floor, which was boarded. There were also a few shelves, the only fittings. A stone hand-mill for grinding corn, a wooden churn for making buttered tea, a large iron cooking basin, several bamboo baskets and some long-handled brass ladles made up the household goods. There were also a few bamboo mugs, a plough and weapons, a cross-bow and a gun, on the wall. It was rumoured that the headman had a china bowl; but we never saw it, so I cannot vouch for the truth of the rumour.

It was pleasant to see fields, with fences round them: permanent cultivation at 6000 feet, not just hill clearings, although there were hill clearings too. The spring crops are barley and peas, and the summer crop is maize. Peaches are grown, but the flowers are more attractive than the rather hard fruits, though we did eat them stewed. So the Tibetans are not badly off, growing their own grain from which they make flour and meal, their own vegetables, such as peas and spinach, and keeping flocks which give them milk and butter and clothing too. They keep pigs, sheep and goats, and there are plenty of wild animals they can and do shoot both for meat and for their skins, the commonest being goral, serow and barking deer. Monkeys and bears are also found.

The Darus, whose huts are scattered up the valley for another half mile, sometimes a thousand feet above the river, are less favoured by man and nature. They own no flocks, and, the Tibetans having occupied all the flat land for permanent cultivation and all the best grazing slopes, only the more resistant wooded slopes remain for the Darus. The acreage fit for temporary cultivation is closely limited by the steepness of the mountains and the consequent lack of soil, and on sheltered, that is to say north-facing slopes, by the denseness of the evergreen forest.

Our own house stood on the river bank at the mouth of a gully, down which flowed a trickle of water. I often went up the gully to watch birds and squirrels, but it was a blind alley, and I would hardly have noticed it, but for a dramatic incident which happened later. To one side of us was an overflowing channel of the river at that time almost dry, though during the rains it became impassable. Just above the village on our bank the mountain sloped at so steep an angle that in many places the granite rocks showed through the veneer of soil. This exposure was increased artificially by the local inhabitants who, taking advantage of the fact that the slope faced south (the river here flowing from the west), had long ago cleared it of forest and now burnt the bracken and grass covering annually. In February the face of it was a brown scar for a thousand feet, presently to be charred in patches. A few great pines had resisted generations of fires and mocked the destroyers even as did the granite tors. But the mountains rose far above the limit of man's interference, to forests of coniferous trees, and beyond them was scrub, reaching out to the alpine slopes at 15,000 feet.

Across the river, by contrast, the mountains were covered with forest so dense that man could make no impression on it at all. These slopes had been cleared neither for cultivation nor grazing; and never would be. This was virgin or climax forest — the highest expression of vegetation to which the climate of the Adung valley above 6000 feet could give rise. But the climate changed rapidly as one ascended, and so did the trees of the forest. Opposite our camp, a rockslide had ploughed a broad furrow through the forest, stripping it to the naked rock; it was surprising how little soil there was to support those great trees.

About a mile beyond the village, the Adung river sprang out of a gorge and slewed round a high snowy mountain, which blocked further view. There was a track up the valley and through the gorge, but it was not a good one. I supposed that, when the summer came, the Tibetans would take their herds up the valley to the alpine pastures. But I was wrong. The track was so bad that even Tibetan cattle would have had some difficulty in following it. Moreover, the alpine pastures were poor, as we discovered later. Yet neither of these objections was valid. Had the Tibetans wished to take their cattle up the valley they could have made the track passable, and they could certainly have encouraged the growth of pasture in suitable places, at the head of the valley, as is done all over Tibet. There is sufficient grazing in the adjacent Seinghku valley; there would be grazing if the Tibetans wanted it at the head of the Adung valley. The real reason why the people of Tahawndam did not venture far from their village was that they were afraid of those who lived on the other side of the mountains. So in summer they took their cattle up to the top of the range immediately above the village from where their enemies could not easily steal them. In fact raiders had to come right down to the village to harass the people at all, and this during the rainy season was not easy. The Tahawndam folk purposely kept the track in ill repair so as to baulk them as much as possible.

But the Tahawndam Tibetans are themselves intruders into the Adung valley. They had originally come from the other side, whether as fugitives or as pioneers no one knows. They had found only the timid Darus in possession, and had stolen the best land from them. Not that the Darus would have had permanent cultivation, or good grazing for their flocks, in any case. The flat land was wasted on them. The Tibetan settlers had certainly made the most of their holdings, and then, having driven the weaker tribes out of the way, had settled down with them, used them, and in return taught them something of their own arts. Thus the two peoples, so different in their mode of life, the one sprung from the high plateau country, the other from the jungle, formed a true commonwealth.

The Tibetan settlers are compelled by force of circumstances, as well as by the ties of blood and tradition, to keep in touch with the communities over the mountains from whom they are sprung. Indeed they are to some extent dependent upon these other communities for supplies, for cattle, for clothing and for women. There are, of course, the Daru women; but they are incidental. Tahawndam is an outpost of Tibetan civilization, and some traffic with the main body is inevitable. Moreover, the parent body from which this little colony came is not content to lose its satellite so easily. Why should these people be exempt from paying taxes because they have crossed a mountain range into another valley? One suspects, indeed, that a too grasping Tibetan official might have been the cause of their flight. But vainly, if it were so. The plea that they had crossed the frontier into British Burma and were therefore no longer liable to pay taxes to a Tibetan overlord would be laughed to scorn unless the overlord could be persuaded that the Burma Government would support their plea, if necessary, by force. Along these marches, as I have said before, frontiers do not mean much. Here, between Burma, China, and Tibet is No-Man's-Land, or Any-Man's-Land. No central government, neither the British Indian, nor the Tibetan, nor the Chinese, directly administers these ultimate mountains at the sources of the Irrawaddy; and the British Indian Government is the only one which has claimed and surveyed a definite frontier. But since it cannot, at any rate does not, administer right up to that frontier, it is not surprising that others flout it. Mountain people cannot be expected to know where the frontier, as made in London, Lhasa or Peking, runs. The Indian Government has striven to demarcate what western nations call a 'natural' frontier at the sources of the Irrawaddy. It does not claim the whole Irrawaddy basin because some of the larger headwaters rise in what is indisputably Tibet and break through the range, flowing in gorges which are all but impassable — the Taron for example. That range constitutes a 'natural' frontier. But what is a mountain range to a Tibetan who cannot go anywhere without having to cross mountains? No eastern Tibetan baron, who is independent of Lhasa, would ever regard a mountain range as setting a limit to his activities. He knows nothing of international or political boundaries. He rules where he is obeyed. There is a natural limit, however, beyond which the Tibetan does not spread. Normally he cannot live below 10,000 feet. Only land hunger has forced him over the mountains into the Irrawaddy jungle, where, finding himself unopposed, he has adapted himself to new conditions. Yet he cannot survive — as a Tibetan — below about 6000 feet, the limit

of pine trees. And the pine tree contour, to a Tibetan, would be a 'natural' frontier, not a bad one either, and more easily defined than a mountain crest, or a watershed, involving intricate observations with complicated instruments, followed by tiresome sums.

Thus the Tibetan colony of Tahawndam has ties with the people over the mountains which the aborigines do not possess. It cannot completely break off relations with Tibet even if it wished to do so. It has to pay taxes. Nor is it strong enough to protect the people whose land it has usurped from further spoliation. The resident Tibetan population would much prefer to have a monopoly of exploiting the Darus. Squeezed between the Tibetans and the more powerful Nungs of the Tamai river, the Darus are everybody's property. Ultimate extinction is their inevitable fate. Fused with the Tibetan element, a hybrid tribe may linger on in the Adung valley.

The position of the Tibetan settlers themselves is not enviable. They must pay taxes to their Tibetan satraps, and it is unlikely that they will for ever escape paying taxes to the Burma Government. Whether the Burma Government can protect them is another matter. Fort Hertz, the nearest outpost, is about 200 miles distant. During the rains the Adung valley is almost isolated, and it is then that the raiders from Tibet exact their demands.

Agricultural operations began in February; but nothing very much happened till the new moon on March 18th. We could not see it, but the calendar assured us it was there, and the Tibetans who had no calendar were equally confident. So they made revelry after dark.

But what the headman really enjoyed was to take his gun and his yellow dogs and go hunting up on the cliffs, 3000 feet above the river. Cranbrook was anxious to accompany him on one of these shoots. At first Tsering would have none of it: he realized that Cranbrook had the better weapon and was afraid he might exterminate the game. But, as soon as Cranbrook convinced him that he would pay for what he shot, the headman came to terms. Cranbrook had already made a preliminary ascent of the grass slope. That was on February 8th, and he reported it snowing higher up. February 15th was fixed for the first serious goral hunt with dogs; but before dawn the weather looked so bad that I persuaded Cranbrook to postpone it. As it happened, the day turned out comparatively fine. Ten days later, after a spell of very wet weather, Cranbrook went off with the headman, the orderly and two yellow long-haired hunting-dogs. They climbed the mountains on the east side of the valley, intending to be out the whole day. The same day I went up the river to explore the Adung gorge, and I heard all about the day's sport when I got back. After a rather exhausting climb the hunters reached broken country where granite tors stuck up all round the skyline like decaying teeth. By this time the party were at an altitude of 8000 or 9000 feet. Snow lay under the trees, and it was unpleasantly cold, with a raw wind.

The yellow dogs were eager and went yelping into the forest, but the headman, trailing his six feet of gas pipe, was professional and mysterious. I pictured Cranbrook, exhausted by the swift climb, chilled by the wind, but quite undaunted, making a good effort to keep up. The

headman now called a halt and warned Cranbrook that there was game about. Almost immediately the yellow dogs with a squeal of triumph chased a goral from cover and sent it bounding up the crags. The headman, who had posted himself in an advantageous position, was the first to take aim, and after a good deal of preparation, lighting the fuse, depressing it with the trigger and the rest, he fired his curious piece. No result, except that the goral moved on. Eventually it was Cranbrook who dropped the animal at 200 yards' range, where the Tibetan weapons couldn't reach it. Unluckily the goral, shot through the heart, fell off the rock over a precipice and was lost. Even the dogs could not reach it. The short winter's day was now drawing to a close, and the hunting party decided to return to camp. Next day the headman went up the mountain again and after a search retrieved Cranbrook's first goral.

The goral is a mountain ruminant, something between a goat and an antelope. It is more or less goat-shaped, but considerably smaller than most wild goats — standing less than two and a half feet at the shoulder. The short, black, cylindrical horns are sharply pointed and roughly ringed in the lower half; they are slightly curved and a little divergent. The tail is short, but otherwise ungoatlike, and the face beardless. Goral are found in mountainous regions from the Himalayas to Japan, usually below 8000 feet. It is on the high frontier ranges of Assam and Burma that they reach the highest altitude. In the summer of 1926 I met them as high as 14,000 feet, jumping about on the alpine turf slopes or climbing the cliffs above the Seinghku valley. They were always solitary. In July 1928, while exploring in the Mishmi Hills, I almost stepped on a female lying in thick rhododendron scrub on a steep face at 12,000 feet and on looking down I saw at my feet a baby goral, aged a few days, which I picked up and carried into camp. In December 1924, I saw two foxy red goral in the Tsangpo gorge. The most conspicuous mark of the Assam animal was the dark stripe down the back. I obtained no specimens between 1924 and 1931, but I have no doubt these are all the same as Cranbrook's goral (*Cemas Cranbrookii*).

With a barking deer, chased into the river by dogs and shot with poisoned arrows, and Cranbrook's goral, we had plenty of fresh meat and were living well in spite of our cook. The Tibetans added to the variety of food. One day the headman brought us mead, brewed from the local honey, which at this season must have been rhododendron honey. It had no ill effect, other than making us completely drunk. But when in early May he brought us real honey, it was a different story. I had gone out for a climb and later in the day Cranbrook started off as usual with his gun. When I returned, I found him in bed, not quite sure how he had got there. It appears that he had hardly gone a quarter of a mile up the river bank when without warning he had collapsed and fallen into the backwater. The water had revived him somewhat, and though unable to walk he had climbed out of the river and shouted for help. Presently he had recovered sufficiently to crawl towards the camp. One of the men heard him. He was helped back and put to bed. By evening the symptoms had passed off, and Cranbrook was his cheerful self again. But it

was an alarming experience. Had he fallen into the main river he must inevitably have been swept away and drowned before help could arrive. Meanwhile Mano had obtained a supply of honey. No sooner had he eaten some — and doubtless he was immoderate — than he too felt ill, and retired to bed. The symptoms might be described as those of acute alcoholic poisoning. Proud of my supposed immunity, for I had suffered the same vapours in previous years, I continued to eat popcorn impregnated with wild honey. But after a day or two, feeling listless, I began to fear chronic poisoning myself and gave up honey.

Everyone remembers the classical example of the Greeks under Xenophon, poisoned with pontine honey on their return march from Persia. It is obvious that *Rhododendron ponticum* is not the only species which yields toxic honey. Whether or not all rhododendron honey is poisonous is an unsolved problem. But since the hill tribes and Tibetans eat wild honey whenever they can get it without any serious harm resulting, it would appear that they are immune from its effects. I cannot help wondering if, with the increasing cultivation of rhododendrons in the south and west of England, most of which flower between May and June, there may not presently be cases of honey poisoning in this country. That would be something for the Press. It is a curious fact that ling and bell heather honey which are reckoned the best brand are definitely not poisonous, while rhododendron honey appears to be always toxic, although these plants all belong to the same family. Ling honey has the curious property called thixotropy, that is to say it sets into a colloidal state like jelly, and for that reason cannot be removed from the comb by centrifugalizing it. It is not known whether this is true of rhododendron honey.

I have already said something about the Nung or Hkanung (i.e. 'slave Nung') tribe. As one travels northwards up the Tamai and Taron valleys into higher, colder and bleaker regions, the population grows scantier. The people are poorer, worse fed and smaller. Finally, at the headwaters of the Adung river, they are pygmies. Nevertheless the Hkanung and Daru languages are almost identical.

At first sight it looks as if the Tibetans were deliberately exterminating the Darus. That is not so. The Darus may perhaps yield to Tibetan pressure, but the last thing the Tibetan wants to do is to exterminate his 'host' and break up the partnership.

The Darus appear to be the only tribe of the upper Irrawaddy who have no generic name for themselves. Ishmaelites they are, wandering through the mazes of the jungle. The Tibetans call them Dalu or Talu; the 'r' being a later phonetic addition. Now the Mishmi who live in the Lohit valley below Rima, to the west, call the Lohit river Tellu. Is this a coincidence, or does it indicate a close relationship between Mishmi and Daru? It is possible that the Darus are Mishmi who have crossed the mountains into the basin of the Irrawaddy. It is equally possible that the Mishmi call the Lohit Tellu because it rises in the country of the Tellu, a tribe different from the Mishmi. That would mean that they lived in Upper Zayul, but are now merged with the Tibetans. Whether or not Mishmi and Daru are related, it is

probable that the hill tribes of north-east Assam and of northern Burma were derived from a common stock. With the vast cyclonic motions of the main human currents slowly pressing towards the plains, it was inevitable that weaker offshoots should seek the comparative calm in the centre of the human storm, even though the calm there were the calm of everlasting sleep.

There can be no question, however, that there is only one tribe at the headwaters of the Irrawaddy, whether their name be Daru, Dalu, or Talu, Dalong or Talong, these last being the inhabitants of the Taron valley. They speak practically the same language, and their customs are similar. They are all Daru, as we may continue to call them. We do not know whence the Hkanung came. They are an offshoot of the Kachin or Chingpaw family; but of their wanderings before they were thrown on this scrap heap of Asia we know nothing. The religion of all these tribes is a primitive animism, nor has contact with the Tibetans substituted Buddhist symbols for a simple belief in spirits everywhere. It would be truer to say that the Tibetans who cross the range become infected with animism. The reason is clear. No Tibetan Buddhist monk considers it worth while to spread the gospel in such country amongst such people.

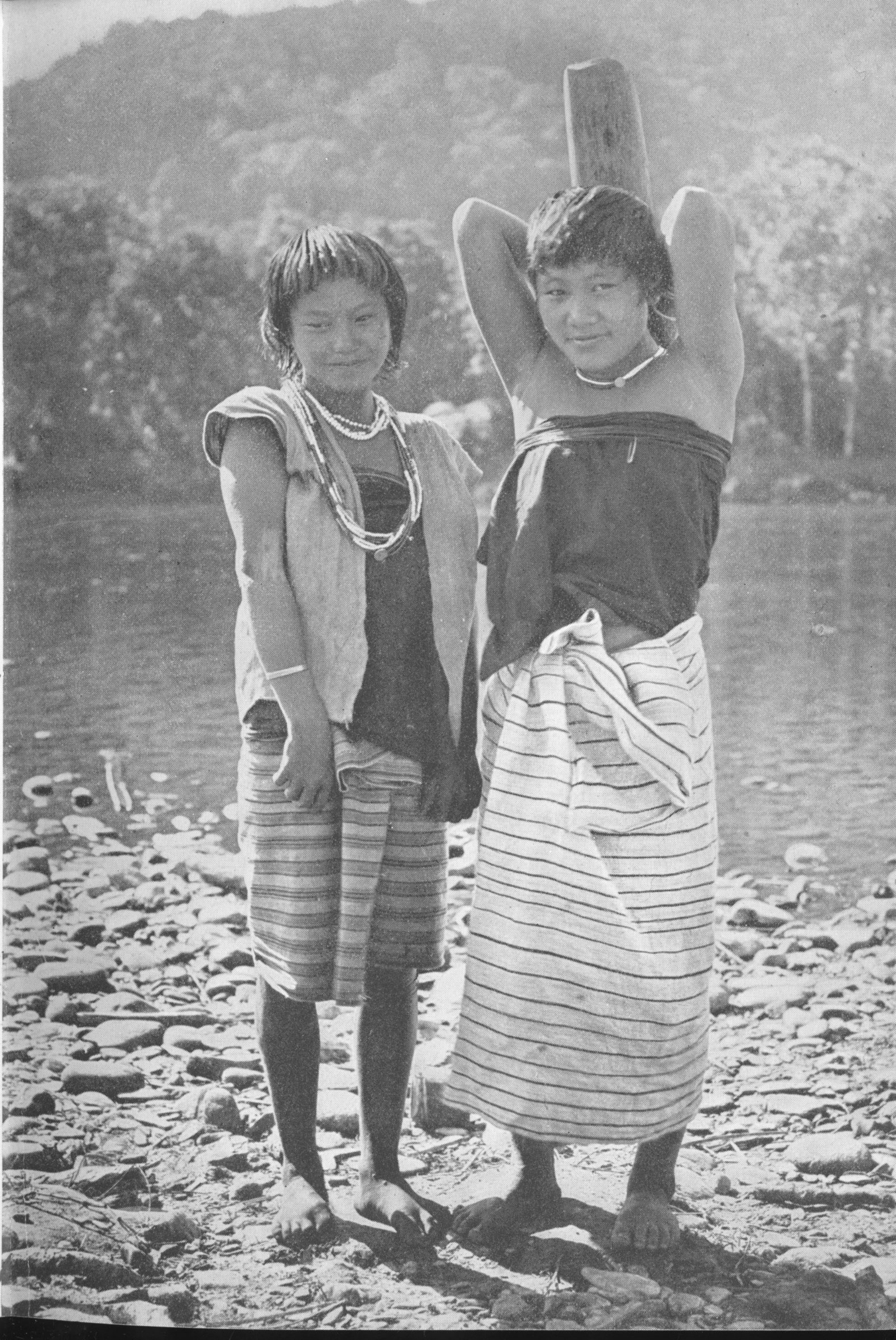
There were several concealed Daru huts (one could hardly speak of villages) in the Adung valley. One I visited was nearly a thousand feet above the river. After the snowfall of March 2nd, snow lay all day at that height, and it must have been wretchedly cold for the almost-naked people. The Daru hut is merely a square box of rough-hewn logs, three to four feet high, with a grass thatched roof. The wind whistles through the crevices between the logs, but that is no great matter since in any case there is a gap of at least two feet between the walls and the roof.

The Tibetans were not particularly handsome, but the Darus were with few exceptions exceedingly ugly. Well under five feet in height, with round faces and heavy features, they dressed in rags and were dirty like wild beasts. Their noses are flattened, their prominent lips thick, their eyes dull; their short, matted hair falls in an even fringe all round. But they are pleasant people. Servile to perfection, they are hard-working, cheerful and possessed of almost unlimited endurance.

Though jewellery is almost unknown, feminine charm is supplemented in various ways. Women wear fine rings of lacquered cane round the calf; and on these they thread metal rings, sometimes as many as half a dozen on each leg. They also wear bead necklaces, and occasionally silver charm boxes from Tibet. But their most interesting effort at decoration is the tattooing of their faces in a pattern of blue noughts and crosses. Tattooing is optional, and by no means all girls indulge in it, any more than all English girls paint their lips vermilion and their nails the colour of clotted bullocks' blood.

Between Tahawndam and the mouth of the Adung gorge, a distance of a mile, there were several Daru huts with a total population of about thirty people who were under the orders of the Tibetan settlers. But the Daru population is by no means settled; huts disappear, to reappear elsewhere. Above Adung Long, the total popu-

[*facing:* DARU GIRLS
The water vessel is a bamboo tube



lation of the Adung valley and its tributaries does not exceed a hundred persons, men, women and children. If they all perished to-morrow, nobody would mourn. It is not men, but rhododendrons, which give the Adung valley its fame.

CHAPTER IX

A BIRD PARADISE

IT was a bleak February afternoon when we settled down to collect plants and watch birds in the Adung valley. Except for a few days at our 'week-end' hut we did not move from our base camp for three months and so we got on familiar terms with the lower valley. I soon found that the most fertile period for watching birds was from dawn till about 10 a.m. In the afternoon the birds withdraw into the forest. Almost every morning, therefore, after a cup of tea I sat near the entrance to my hut which overlooked the river and watched for an hour. As long as the trees were leafless, it was easy to note the new arrivals, but after April the leaves came out so quickly that it soon became almost impossible to see any birds except in flight. Occasionally I shot a specimen, but usually I contented myself with watching. Systematic collecting I left to Cranbrook.

As the rhododendrons blossomed one by one, more birds came up the valley from the warmer regions below to sip their honey. When we first reached Tahawndam, the only rhododendron in flower was the splendid *R. magnificum*. A specimen tree, which must have been old when King George the First reigned in England, stood on the river bank, its mighty branches radiating in a fan vault over the water. At a height of five feet from the ground the trunk was a yard in girth. This

colossus bore a thousand trusses of flowers, all in bloom at the same time. I have never seen a more magnificent tree. Inside the forest there were other specimens as big, but you could not get a clear view of them. Yet their massed colour was wonderful. Much smaller than *R. magnificum*, but equally common, was the rosy crimson *R. pankimense*. This was in bud when we first arrived, but not in bloom. It first opened its flowers during the third week of February, and it was this abundant species more than any other which attracted the birds.

Among the first comers were the sunbirds. Perhaps they were here before us, since we noticed them immediately after our arrival. They are the jewel-birds of the temperate rain forest region. The first signalled, and also the commonest, was the Nepal yellow-backed sunbird (*Aethopyga nipalensis*), which I noted on February 6th. A month later we saw Dabry's sunbird (*Aethopyga dabryii*), but it was less common than the other. Then in June, when the wave of migratory birds had gone up into the hills where the alpine rhododendrons were flowering as fast as the snow melted (or even flowering in the snow), we met the Yunnan fire-tailed sunbird (*Aethopyga ignicauda*), a western Chinese species. But it was the common Nepal sunbird, with its brilliant orange breast, all iridescent blues and greens on head and throat, that I saw day after day in the bare February trees, a flying cut of a jewel from some Aladdin's cave. Into the winter gloom and coldness of our valley it seemed to bring the joyousness of tropical blue seas and hot yellow sands.

The river itself was a favourite resort of birds. At Tahawndam the Adung is thirty yards wide and shallow, but there were days when it rose like an angry snake and lashed the banks. There was always a fast current. The white-capped redstart (*Chaimarrornis leucocephalus*), a non-migrant common on the mountain streams from the Himalayas to China, kept very late hours. Long after all good birds had gone to bed, when there was only just light enough to see by, this brisk little redstart, neat, cheeky and efficient, would speed along just above the surface of the lead-grey water, its shrill voice piercing through the noise of the cascade. The plumbeous redstart (*Rhyacornis fuliginosa*) kept almost as late hours. Both birds perch on rocks in the river, hawking flies, then skim across the ruffled water to another ambush. Cranbrook noticed that the plumbeous redstart had a trick of flying vertically upwards in the evening to a height of twenty feet or more, then swooping down in a spiral to the level from which it started — another fly-catching device. One evening I watched this bird dive at high speed to the river, hit the surface and ricochet off again like a kingfisher. It could hardly have been fishing since its beak is like a badly sharpened pencil; but the imitation was good.

A third evening performer was a chocolate-brown dipper (*Cincius pallasi*) of retiring habits. It lurked on rocks and along the bank. When approached, it would plunge into the swift current, swimming boldly, and if necessary dive under the icy water, remaining submerged for a minute or two; then reappear in some unexpected place. It was frightened at the sight of a man. Several wagtails haunted the river or more often some rocky stream-bed hard by or even the adjacent fields. The

most constantly seen was Hodgson's yellow-headed wagtail.

We expected to see numbers of duck migrating northwards, but in this we were disappointed. The Adung valley is not on the main line. One evening we did notice a flight of anonymous fish-feeding duck settle apparently close to our camp, but when we reached the river bank they were gone. On a luckier day Cranbrook shot a common teal and skinned it under the impression that it was a *rara avis*. It was — in the Adung valley. On more than one occasion I put up a solitary snipe, and on February 17th Cranbrook shot one, but it was too badly injured for a specimen. We enjoyed eating it, none the less. Half a snipe is better than none, even if it is stuffed with lead pellets. On another occasion Cranbrook shot a cormorant which had spread itself out to dry like the German eagle. Being meatless we ate it and found it more palatable than we had expected, though to be sure it was oily. All the fisher birds, though rather strong, are quite good eating if skinned. In China, that land of exotic dishes, I once shot and ate a merganser; but I was short of food. Brahminy duck, too, though avoided by epicures, is another succulent Chinese memory. In fact I do not know of any bird which is really uneatable — unless it be a high English pheasant.

I did not entirely confine my bird-studies to the early morning, though that was the best time, when, wrapped in a Tibetan *chupa* like an outsize dressing-gown, I would sit at my table simultaneously dissecting plants and watching birds in the trees along the river bank. Whenever I went out plant-hunting, I kept one eye on birds

The clumsy Sibia is not so well adapted as the dainty sunbird to extracting honey (the tongue of the latter is rolled up into a tube), but he is a very determined fellow. I saw three Sibias together in a single bush of *Rhododendron pankimense*, and they battered the flowers cruelly. Another constant visitor to this rhododendron was the Yunnan green-backed tit, one of the commonest birds in the valley. I observed this bird also using force, and I rather suspected it of perforating the base of the corolla. Probably many birds ill-equipped, or unskilled in the delicate operation of sucking honey from a gland, but desperately anxious to obtain it, use force. By early March the corollas of *R. pankimense* lay in heaps under the bushes like the smouldering embers of a raked-out fire, most of them having been pecked off round the base.

The fire-tailed Myzornis (*Myzornis pyrrhoura*) and a barwing (*Actinodura nipalensis*) were also found to be transporting rhododendron pollen, but I never saw them poking their heads into the flowers. The breast of a fire-tailed Myzornis I shot was yellow with pollen from *R. pankimense*. Altogether I recognized six different birds which habitually visit rhododendrons and carry pollen from flower to flower; three of the rhododendrons I identified, and at this season there were not more than six or eight suitable species in bloom; only those with large bell or funnel-shaped corollas attract birds. But the commonest type of rhododendron flower, that represented by *R. arboreum*, *R. barbatum*, *R. grande* and many others, is the best adapted to pollination by birds, so that it seems probable that many more birds than those mentioned above are engaged in this traffic, and many

[*facing:* RHODODENDRONS IN THE ADUNG VALLEY

more species of rhododendron are habitually pollinated by birds.

Cranbrook went out nearly every day and never returned empty-handed. It was Cranbrook's busy season; for we were trapping small nocturnal animals as well as shooting birds, and he had to skin them all. Not that we caught a great many mammals, for the variety of fauna was small. It consisted chiefly of striped shrews, white-bellied rats, water-shrews and moles. There were few squirrels and no voles here — or if there were we did not see them; most of the squirrels were lower down and the voles higher up. We saw Tamiops and very few chestnut-bellied squirrels.

Botany occupied most of my time, for the flora was obviously a rich one. I was anxious to collect as many species as possible before April, when everything would be coming out at once, and I should be overwhelmed; but until the trees flowered it was not much use to collect them owing to the impossibility of identifying them.

I first saw *Michelia doltsopa* in flower on February 5th, and it continued well into March, by which time the new leaf-buds were breaking. The ivory-white flowers are sweetly fragrant, but they do not scent the forest as some trees do. This fragrance is noticeable with newly-dried specimens, which are perhaps even more delicately scented than fresh ones. One of the pleasantest manners of this Michelia is the way it clothes its naked limbs with new flowers after the last flush has been nipped by snow.

On the night of February 9th snow fell heavily, and when we looked out on to a ghostly world the next morning all the Michelias were in ruins, their beautiful starry flowers blackened and blasted beyond recognition. Yet within a few days a new flush of flowers had spread over the trees, which looked more bewitching than ever. There were trees in bloom down the valley as early as February 1st, and others up the sheltered side of the hill as late as March 21st. The late-flowering specimens were the finer since they had never been devastated by frost. The silky-pointed thimble-cap which covers the flower bud sometimes splits down the side and sometimes transversely across the middle. *Michelia doltsopa* is a tall, handsome tree, seventy-five to a hundred feet high. It is found scattered all up the Adung valley, generally near the river in temperate forest, between 6000 and 7000 feet altitude, associated with *Pinus excelsa*, elm, ash, oak, cherry and rhododendron.

These cold spells did not seriously hurt the rhododendrons which were in bloom, and the only visible effect of the February snowstorm on *R. pankimense* was to loosen some of the corollas, which fell and continued to glow from the ground. The leafbuds were still closed, wisely, so there was no chance of the young foliage being injured. A ruined flower crop does the plant no direct injury, though it prevents it from producing a family for a season; but frozen leaf-buds may seriously affect the health of the plant and even endanger its life.

Cranbrook soon enlisted the local small boys as enthusiastic collectors. A bare-footed urchin — they were hardy lads here and went about bare-footed even in the snow — would enter with a small bird spitted on a cross-bow arrow. Not that they were deadly shots, these lads, for the cross-bow of the hill tribes is not a weapon of

precision. They registered more misses than bulls, but we were rather surprised that they could hit anything smaller than a mountain. The village hunters, however, were expert cross-bowmen; and indeed this indifferent weapon was their only armament. Using arrows poisoned with aconite, they shoot goral, monkeys, serow and barking deer. We were offered a barking deer which had been killed in this way, and wondered whether the meat was poisoned or not, for the arrow had been taken out. We found the wound, cut away a little of the flesh round it and actually no ill effects followed our eating the meat.

The dry channel by our camp was lined with a great variety of trees and shrubs, in contrast to the barren hillside above the village (though the extreme bareness of this southern slope was due to the annual burning of the grass rather than to natural causes). Every deep gully, even on the exposed side of the valley, was filled with forest. I enjoyed walking up the river-bed exploring the thickets on each side. Almost every time I noticed new shrubs which had previously escaped me. It is quite easy to miss even a large shrub, especially if it is not in flower; only gradually can one acquire knowledge of a flora so varied as that of temperate northern Burma. A tangle of small rhododendron covered a large boulder in the dry river-bed, and the crinkled, dark-green leaves, furry-brown underneath, though rather small, were very similar to those of the beautiful Himalayan *R. Edgeworthii* or its Chinese counterpart called *R. bullatum*. The flower-buds were still tightly shut; when they opened they proved to belong not to the white-flowered *R. bullatum*, but to a certain yellow-flowered species I had found some years previously in the Seinghku valley and named *R. seinghkuense*. It was at the end of February that it opened its first flowers. Though there is no resemblance between the large scented white flowers of *R. bullatum* and the small yellow flowers of *R. seinghkuense*, the two are singularly hard to distinguish out of bloom.

This *R. seinghkuense* is a curious plant. I discovered it almost by accident in 1922 when on a journey from China to Burma not far to the east of the Adung valley. It was in fruit, and, taking it for a rather odd form of *R. bullatum*, I sent some seed of it to England, describing it as a climber. For some years it was known as my 'climbing bullatum'. The plants raised duly flowered, and proved to be not *R. bullatum* at all but a new though allied species. Meanwhile, again in far northern Burma, I had discovered the plant later christened *R. seinghkuense*. It was in flower, growing in the wind-scarred tops of silver fir trees, and when the 'climbing bullatum' at last flowered (it took twelve years to do it) it was found to be identical with this new species from the Seinghku valley.

There were many laughing thrushes in the woods. With the gradual ascent of spring, they went up the valley in waves to the limit of trees. It seems curious that these birds should be called 'laughing'; anything less like laughter than the rather mournful, monotonous notes so many of them utter in the spring, it would be difficult to imagine. In winter, however, most of the laughing thrushes go down into the hill jungle and congregate in large flocks on the ground under the bamboos. Suddenly a wild chortling will startle the traveller, and this outburst from twenty or thirty birds might perhaps be

likened to laughter. Once I watched a flock of grey thrushes glide in single file along the branch of a tree; each bird moved with the stealth and ease of a squirrel, quickly and silently.

Tits were also numerous, particularly a little green-backed bird with a yellow waistcoat (*Parus monticolus yunnanensis*). In the early morning it was always to be found amongst the raspberry canes eating the rather arid fruits left over from last season. Sometimes it would hover, not unlike a sunbird, pecking at the flowers of the silver-leafed *Rubus lineatus*; or it would alight on a cane and thrust its head upside-down into a flower. Later in the day it turned to a honey diet, obtained from *Rhododendron pankimense*. Not content with obtaining the honey, it pecks away at the honey-secreting tissue itself. At one time I saw four of these birds together on a rhododendron bush, the corollas of which, perforated round the base, were falling like autumn leaves.

I am a bad sleeper, so that I have never found it difficult, on an expedition, to get up early. On February 21st it was barely light when, as usual, I rose at 6 a.m., dressed warmly and went out into the raw air of morning. My first task was to visit the half-dozen mousetraps I had set the previous evening. Sometimes there would be a brown mouse or a striped shrew in one of my traps, but just as often there was nothing, though I always hoped to catch a water-shrew (*Chimarrogale*). No number of failures has ever persuaded me that I shall not some day discover a new genus of mammal. However, this morning the traps were empty.

If I had no traps out I would take my gun and scout for duck along the river or for a snipe down in the woods. The dawn foray did not take very long, and was largely undertaken to satisfy myself that Ba Kai was lighting the fire and preparing tea; I am never bright at that hour until I have drunk tea. *Chota hazri*, consisting of tea and chupatties, was at 6.45 a.m.

Cranbrook now appeared. He rarely appeared earlier, though, for a good enough cause, he would spring out of bed at any hour of the night you cared to wake him; nor have I ever met a man sweeter-tempered when roused from sound sleep. Breakfast was at ten. Only when a big climbing expedition was forward did we combine breakfast with *chota hazri*. Between seven and ten we did our indoor work: I changed plant-paper, dissected flowers and made my notes, and in the intervals of botanical study watched birds or peered through a field-glass at the mountains, to see what new tree had come into flower overnight. Cranbrook, in the meantime, skinned specimens and kept his zoological diaries up to date. After breakfast we sallied forth for the serious work of the day, sometimes together, but more often in opposite directions.

To-day I went down the valley and crossed the river by the cane bridge. The heavily-wooded mountains were precipitous here. On the bare cliff-face higher up I could see a scarlet rhododendron. It was not many hundred feet above the river, but there was thick forest below, difficult to penetrate. I soon lost direction, and as the escarpment did not stretch far down the valley there was a doubt whether I should hit off the base of it. The trees were dripping wet and the clay ground slippery; a musty

smell rose from the fermenting mould. Presently a slight itching pain under my belt became more pronounced and another similar irritation started on my thigh. The itching became intolerable, and I had partially to undress and deal with the ticks which had got under my shirt. I foresaw more sleepless nights. I pulled out the ticks which had sunk their heads deep into my flesh, leaving two slightly swollen red marks, dabbed on some iodine which I carried and went on. The slope became more broken. Presently I found myself knee deep amongst irises. The bare cliff rose sheer above me.

Traversing parallel with the base for a short distance, I reached the end of the escarpment and, clambering up the rocks, soon gained a windy ridge above the cliff. Here grew the crimson rhododendron which I had seen from below — *R. neriiflorum*. It is a shrub with gnarled branches and long narrow leaves, wax-white underneath. The outer layer of bark sloughs off and hangs in thin papery rags from the tawny trunk, which is smooth like glass. But the glory of *R. neriiflorum* is its shining, blood-red flowers, borne in such abundance that the bush seems to be on fire. Higher up the valley in the gorge of the Adung grows a variety called *R. euchaites*, which is a small tree thirty feet high. On a certain dry, rocky ridge facing south it became a small bush not five feet high but still a burning bush, wrapped in scarlet fire. Here it was a large shrub. All three varieties are essentially the same species — *R. neriiflorum*.

There was another shrub rhododendron on the ridge crouching amongst the rocks, with large white flowers, feathered yellow at the back — *R. dendricola*, often, as its name implies, an inhabitant of trees. In bud was the lanky, big-leafed *R. Nuttallii*.

Back in camp with a bag full of plant specimens to press, I changed my wet clothes. It was now four o'clock and, Cranbrook having returned, we had tea. I prepared my plants for the press, ticketed them and wrote a short description of each, noting those of which I required seed later. Finally I took a stroll along the river bank to set traps. The day's work was finished.

At dinner, served at 7.30, we talked of other things and made plans for the future. It was a simple meal because we could not run to more than three courses, soup, side-dish, and an entrée; but there was always enough to eat. After dinner we wrote our diaries and read till rum hour, which was at 9.30 — a doch-an-doris before turning in. Ba Kai brought in glasses and a kettle of boiling water, and we got out a bottle of rum and a tin of biscuits. Then we relaxed and really had a quiet time, sipping our rum and chatting. By 10.30 we were in bed.

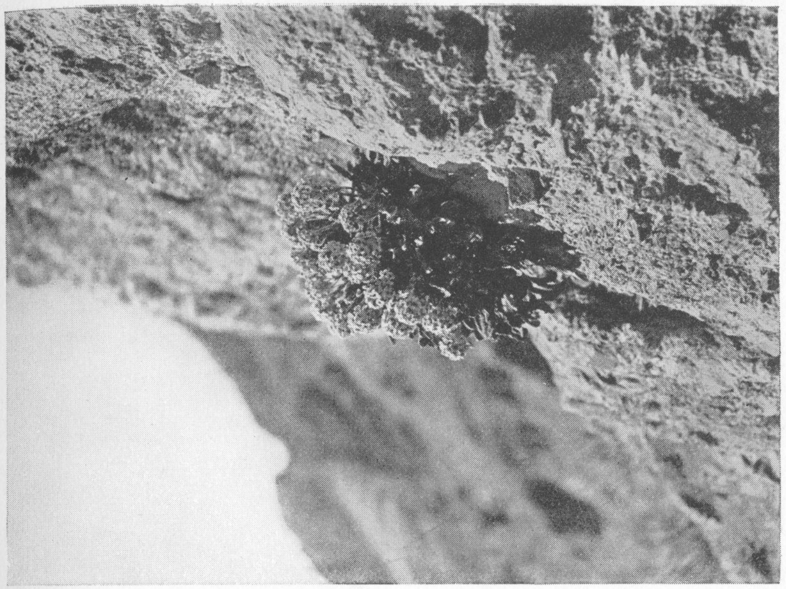
CHAPTER X

MAINLY FOR BOTANISTS

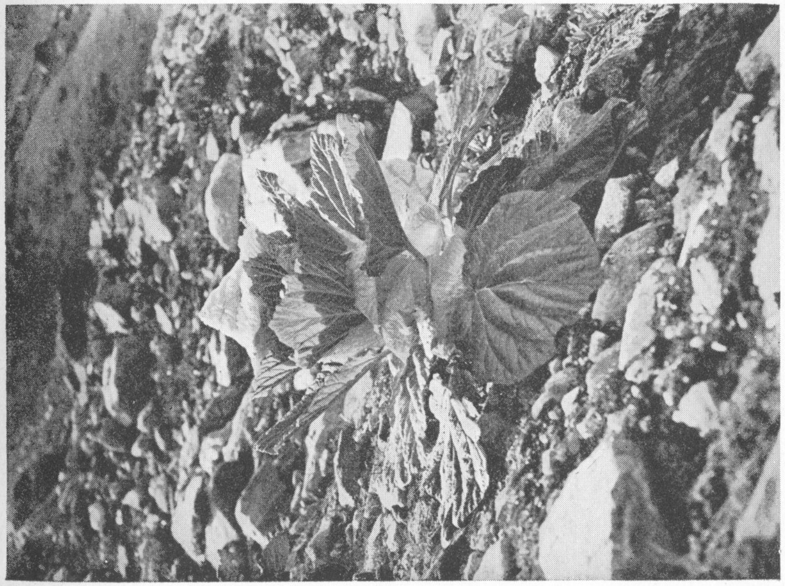
THE day after our arrival at Tahawndam I walked up the valley to the mouth of the gorge. The whole Adung valley from the Singhku river confluence might be called a gorge, but above Tahawndam it is narrower and steeper and more properly gorge-like than lower down. It was the seventh of February. The surrounding hills were white with snow; most of the trees near our camp were leafless; and nothing was in flower under them. But the rhododendron buds were swelling and I was keen to get some knowledge of the forest trees before the rush-hour of blossom. There was a good path up the right bank, but it was blocked in two places by felled trees waiting to be burnt to make way for a new clearing. Above the last hut, however, the cliffs on either side drew together and the river gushed out towards us. Here *Rhododendron magnificum* was a brilliant sight, big trees and little trees, smothered with blossom, which varied much in shade. Looking up the steep gorge from a dizzy path on the edge of a cliff, one saw the rosy bobbing heads scattered amongst the sombre firs, like fairy lamps on a Christmas tree, far into the distance.

Just at the entrance to the gorge was a clump of small rhododendron trees, with long narrow leaves closely crowded and tawny trunks from which ragged ends of tissue-paper bark fluttered. The blood-red orbs of glossy flowers were just beginning to open; they glowed hot amongst the snaky branches. *R. euchaites* is the scientific name. Before the end of February it was in full bloom; at 8000 feet altitude it opened later and lasted longer.

There was one other species of rhododendron in flower here. My attention was drawn to it by some yellow corollas strewn on the ground, but as yet I could not see their source. Craning my neck I spied a shrub perched inconveniently high on the bough of a tree above my head. It was an epiphyte. Presently, a short distance away, I noticed a similar plant growing on a big boulder at the river's edge as such shrubs often do. Detached rocks are quickly covered with moss and colonies of orchids amongst which the seeds of small shrubs germinate. In the thickets which gradually spring up one may find shrubs rarely seen elsewhere, since their home is in the forest canopy where they are out of sight. This yellow-flowered rhododendron had large, rounded leaves, like olive-green wash-leather, and the flowers, which were bright butter-yellow and bell-shaped, were clustered in trusses of as many as six together. At first I took this to be a new species which I called *R. butyricum* in allusion to its butter-yellow flowers. Probably, however, it is identical with the little-known *R. chrysodoron*. Later I found it growing at altitudes up to 8000 feet where it is in flower as late as the end of March. Good yellow-flowered rhododendrons are rare. At least, hardy ones are; and *R. chrysodoron* should prove hardy in mild districts. But although these three were the only rhododendrons in flower, I noticed several species in bud along



A NEW GENUS OF *CRUCIFERAE* AT 16,000 FEET,
DRY CLIFFS, SOUTHERN TIBET



RHEUM NOBILE FLOWERING AT 16,000 FEET,
TIBET

the banks of the river. Most rhododendrons are evergreen, and the leaves of many species are so distinct in shape, texture, or in their covering of hair or scales, that after a little practice one can recognize them on sight. Thus, *R. megacalyx*, a shrub with lovely scented white flowers, though not in bloom, was easily recognized. So too was *R. Taggianum*, also white. Then there was an epiphyte dwarf shrub with tiny box-like leaves, which turned out to be the rare yellow-flowered *R. insculptum*.

This ability to recognize rhododendrons by their leaves has a definite value for the plant-hunter when exploring new country in the winter. I have often collected some unknown rhododendron seed and have been able to tell what kind of rhododendron it was and even the colour of its flowers, though I never saw them. The rhododendron forms its next year's flower-buds in the previous year (alpine species often open a few blooms in the fine early winter months), and it is only necessary to open a flower-bud in order to get at least an indication of the finished colour.

The forest in the Adung gorge was very thick, the trees bearded with moss, their branches congested with ferns, orchids, and small shrubs. Thick undergrowth, amongst which grew tall reed-like *Arundinaria* with rings of thorns like steel nails all up their hard stems, filled the open spaces, and a host of climbing plants helped to screen off the light. Amongst trees of familiar appearance were species of *Prunus*, oak, maple and ash; there were also yew, laurels and other evergreen trees. Only where the natives had cleared and burnt the forest did shrubs grow instead of trees. These were of the most varied types and included, besides rhododendrons, species of Vaccinium and Gaultheria, Euonymus, Ilex, Philadelphus, Deutzia and Viburnum.

I did not visit the Adung gorge again till February 25th. Then, starting soon after 8 o'clock, I reached in two hours the point where I had previously turned back. The path here keeps close beside the river and I went on through the jaws of the gorge, till the river-bed was a thousand feet above our camp. Here, it was as though an earthquake had split the mountains asunder and opened the flood-gates of subterraneous rivers. The bed was choked with enormous granite boulders smashed off the cliff's brow. The air was moist and cold, and the water made a thunderous noise. I was completely shut in by cliffs, though a belt of impenetrable forest hid them from view except where a stream had scored a passage for itself. They looked bare. On the other side of the river there was no room even for a goat to scramble; the cliffs rose sheer from the foaming water, and except for a few gnarled and scattered pines they were stark. The strip of forest through which the track ran was boggy, filled here with thickets of giant strobilanthes (not the one which yields the blue dye), there with clumps of the palm-like *Mahonia calamicaulis* sprouting a crown of stiff, prickly leaves from the summit of its cane-like stem. It was not in flower, but I found flowering specimens, not so tall, in the forest a couple of thousand feet above Tahawndam.

The eighteen days which had passed since I first entered the Adung gorge had brought great changes. *Rhododendron euchaites* was afire; but the rose purple of

R. magnificum was already becoming dim, and *R. chrysodoron* was quite over; its flowers were strewn forlornly over the ground. On the other hand there was a new tree-rhododendron in bloom, *R. stenaulum*, with its baby-pink, over-tender flowers. Both this species and *R. pankimense* had shed enough corollas to form wide tranquil pools of colour on the path, and yet the trees from which they had fallen were vivid, the former pale and refined, the latter a clouded purple. The sheer bulk of rhododendron blossom produced is inconceivable to anyone who has not travelled in these forests. As usual I got myself covered with ticks and was badly bitten. Tick bites itch for days. I often awoke suddenly in the night with every puncture itching and lay awake for an hour, desperately controlling a desire to scratch and scratch until at last control gave way. Then the trouble would start all over again. I have never discovered a satisfactory remedy for the irritation set up by ticks or leeches, though iodine, promptly applied, prevents the sore from festering.

I got back to camp at 4.30 to find our mail had arrived from Fort Hertz a day earlier than I had expected it. Cranbrook came in and we had tea. He had had a strenuous day's hunting, and I was excited to hear the good news that he had shot a goral.

By the end of February, five species of rhododendrons had flowered in the Adung valley, and as many more were in bud. But not one of them formed forests by itself, nor, except *R. magnificum*, formed any material proportion of the forest. The rhododendrons at 6000 feet are scattered trees, bushes and small epiphytes.

True, *R. magnificum* flowered with such a flourish of purple that even a few plants gave the impression of infinite colour; and at higher altitudes where it was more abundant it made a great display. But had every bush been wiped out at one stroke, the loss to the forest would not have been noticeable. *R. magnificum* was exceptional. I was very much surprised to see so noble a tree-rhododendron growing at 6000 feet and lower. Between 7000 and 8000 feet it was abundant in the forest to the point at which it seemed to colour the sombre green of hemlock and fir, and the metallic looking evergreen oaks themselves. But it was never truly gregarious, as *R. sinogrande* or *R. arizelum*. is; it was always diluted with other trees.

In the cool temperate forests of Burma and Assam, where the rainfall is high and the atmosphere always moist, rhododendrons become gregarious at 9000 feet. Between 6000 and 9000 feet, though in considerable variety, they are swamped by many other trees and shrubs, and it is only during the brief flowering-season that they are conspicuous. As soon as the climate changes to cool temperate, and the forest is composed almost entirely of northern genera and species with a very few sub-tropical ones, rhododendrons become dominant. No matter whether the one other dominant is a conifer, hemlock, *Abies* or larch, or a broad-leafed tree, oak, maple or birch, *one* dominant will always be a species of rhododendron. The dominant rhododendrons are shrubs, and higher up undershrubs, and they crowd the landscape. The vertical range of a plant decreases with increasing altitude for the same growth-form. Many trees are found from the plains a few hundred feet above sea-level to

6000 feet or more in the Himalayas; but no tree which is found growing normally at 10,000 feet, ascends so high as 15,000 feet, because 15,000 feet is above the tree line. A number of herbaceous alpine plants are equally happy at 10,000 feet and at 13,000 feet; but those which first appear at 13,000 feet do not ascend to 16,000 feet. Rhododendrons are found from near sea-level, in these latitudes, to at least 16,000, so great is their variety. They simply change their growth form. No other genus of plants does this. They occur in three broad belts: (1) from sea-level to 5000 feet as small shrubs, often epiphytes; (2) from 5000 to 10,000 feet as trees and large shrubs, a few epiphytes; (3) from 10,000 to 15,000 feet as shrubs again, becoming quite dwarf at the higher altitudes.

Since at least 75 per cent of known rhododendrons come from the Himalayan and Chinese ranges, botanical exploration has tended of late to concentrate on that particular field. But he would be a rash man who would put a limit to the number which remain to be discovered elsewhere. By the end of April intensive exploration of the Adung valley had yielded fifteen species, growing between the limits of 6000 and 8000 feet altitude. By the end of May we had established a camp at 8000 feet and had climbed to 10,000 feet, adding another fourteen species to the list. The next two thousand feet, embracing the sub-alpine and alpine zones added seventeen species. This made a grand total of forty-six species, ranging in size from big-leafed trees to prostrate creepers, no larger than an Arctic willow: in colour ranging from the scalding-hot crimson of *R. chaetomallum* through pastel shades of yellow and purple down to the cold marble-white of *R. dendricola*. As for their flowering season, there were rhododendrons in bloom at some horizon in the valley from the beginning of February till the middle of July.

The distance from our base camp to the source of the Adung river was twenty-five miles, and though we occupied three permanent camps at 6000, 8000 and 12,000 feet respectively, only a fraction of the whole area was traversed, let alone patiently explored. The truly remarkable thing is that quite forty of the above forty-six species, whose homes range in altitude from 6000 to 14,000 feet, are being successfully cultivated in English gardens not at the altitude from which any single one of them came, but practically at sea-level — 6000 feet below where the lowest species was collected. While we cannot expect their flowering seasons to remain precisely the same, the same *relative* order of flowering species will be maintained; that is to say, the early flowering species will still flower first, the later flowering species later. They maintain their inherited rhythm and flower when the weather conditions, particularly warmth and moisture, of their adopted land recall those of their homeland. Thus March in England might closely resemble February in the Adung valley. Most of them in fact will probably flower between March and May in half the natural period of six months, the earliest flowering a little later in Britain than in the Adung valley, the latest a little earlier.

The flowering-time of each species in nature, however, is by no means fixed. It depends partly on the altitude at which the specimen is growing. I have already said

that most species have a considerable vertical range, even as much as 3000 feet. Those at the extreme top and bottom of the scale have the least range. Thus *R. magnificum*, found exceptionally so low as 6000 feet, is not found above 8000 feet, and its optimum altitude is about 7000 feet. Similarly *R. campylogynnum*, abundant in the alpine region at about 14,000 feet, is found neither below 13,000 feet nor above 15,000 feet. On the other hand *R. selense* is as common at 10,000 feet as it is at 13,000 feet. The dwarf *R. riparium* also is found through a vertical range of more than 3000 feet.

But there are other factors of equal significance. The valley at Base Camp lay almost east and west, so that there was a marked difference in the hours of sunshine on either flank. Yet such species as *Rhododendron magnificum*, *R. euchaites*, and *R. pankimense* grew on both sides of the valley, stunted on the south-facing or sunny side, more luxuriant on the shaded side. The difference between a specimen growing down at the bottom of the valley and one growing a thousand feet above the river was far from negligible. There can be little doubt that seeds collected from specimens near their topmost limit give rise to hardier plants than those raised from seed collected lower down. In this connection it is worth recording that plants raised from native seed are hardier than plants raised from seed of the same species in exile.

For example, *R. riparium*, raised from my Tibetan seed collected in 1924, has flowered and seeded in England for some years. The plants raised from this home-saved seed are less hardy than the original plants; and the difference becomes still more marked if these second-generation seeds are raised in another country such as the United States of America. This weakening may be due to a progressive loss of vigour. But whatever the explanation, there is no doubt about the result; the plants are less hardy, whereas one would have expected them to be more acclimatized.

It is important to remember that a rhododendron growing in the wild and under-flowering age puts forth its leaves earlier than one of flowering age. This is particularly true of the big-leafed species. I noticed that immature trees of *R. magnificum* had expanded their young leaves by the end of March; but flowering specimens were two or three weeks later. This has a practical bearing. If cultivated plants can be brought to flowering age without being seriously cut by frost, they will henceforth stand a better chance of survival. It is during adolescence that they need protection. Greater liberties may be taken with mature plants, though of course there is always the chance that during a cold spell their flowers will be damaged. But in England this is just as likely to happen in April as in March; and the May frost of 1935 will be in every gardener's memory.

Nearly all species of rhododendrons found growing in the forest are trees, or at least large shrubs, and they all have seeds which are winged. This peculiarity enables them to float easily on a current of air or to scatter in a strong wind, since they start at some height above the ground. Thus they travel a little distance before coming to earth. They are light and expose a considerable surface; in short, they are adapted, though not perfectly,

to air transport. Hence it is not surprising to find seedling rhododendrons springing up not only in every forest clearing but on every mossy limb of every big tree. The air in winter must be thick with rhododendron seed. Few of them remain on their big brothers' backs indefinitely; but there is another type of rhododendron found in the forest region, neither tree nor large shrub, which does. This is the epiphyte. About a dozen species of rhododendron not only start life on other trees but remain there all their lives. They can grow nowhere else — except a few of them on exposed cliffs, or on boulders in the river-bed, which proves that their only reason for climbing on the shoulders of the forest giants is to reach the light. If you examine the seeds of these permanent epiphytes, you find that they are not like those of the forest trees. They are not winged but tailed, that is, spindle-shaped with a tail at each end. They are from four to six times as long as they are broad, whereas the winged seeds are only about twice as long. What is the reason for this? Why should the seeds of epiphytic rhododendrons, unusual as the habit is, differ from those of other species? The seeds are certainly wind-borne and have even more reason to be so than those of the forest trees, since their only chance is to reach a convenient branch, on an upward current of air. Yet there is no obvious reason why they should for that reason be spindle-shaped rather than broad. Perhaps the object is to entangle the seed in moss, where it can most easily germinate. It is no use its settling down on a bare bough.

Alpine rhododendrons, however, do not conform to either type. The seeds of alpine rhododendrons have neither wing nor tail. They are naked, like tiny grains of sand, rounded or angular. And the reason is that in the alpine region it is no advantage for the seed to be widely dispersed; it might even be a disadvantage, perhaps fatal. A light puff of air is enough to disperse rhododendron seed in the alpine region. The way is open. There is no competition. Seeds therefore do not need to be widely scattered. They need not scatter in order to seize upon ground, which is often suddenly and unexpectedly — as by the death of a tree in the forest — made available before there is a rival to claim it. On the contrary they need to feel their way slowly forward into the cold tundra which spreads before them. If the seed is widely scattered most of it will fall on snow or ice or stony ground where it cannot germinate, or, germinating, cannot survive. Thus the granular seed is a wise provision of nature to slow down the advance.

On March 12th I crossed the river by the hammock bridge below our camp and followed the right bank up to the gorge. This was a far rougher trail than the other, and it took me six hours to the gorge and back, an average of about a mile an hour including halts. A stream from the south joins the river at the corner immediately below the gorge, but because the valley is filled with soft snow I could only ascend it a short distance. Peeping out of the snow I saw a leafless shrub, from every branch of which hung stiff bright yellow catkins, like frozen caterpillars, three inches long. It was *Stachyurus chinensis*, a Chinese shrub bearing some outward resemblance to the better known Corylopsis,

though the two are not closely allied. The common February-flowering Stachyurus of our gardens is the Japanese *S. praecox*, and *S. chinensis* may be no more than a variety of this.

On March 14th Cranbrook took me for a climb on our side of the valley to show me the goral country. After panting up the steep grass slope for a thousand feet we reached a patch of 'dry' forest. The trees were stunted and gnarled, and mostly evergreen, with rigid, silver-lacquered leaves, very different in appearance from the 'wet' forest. They were, however, mostly the same trees, with a lighter covering of mosses and ferns. The undergrowth was different. It consisted largely of a dwarf Arundinaria and various rhododendrons, *R. neriiflorum* and *R. pankimense*. Higher up, the dry forest had been recently burnt, and a solid phalanx of shrubs had sprung up. A hazel dangled crimson catkins, and a berberis was beaded with yellow buds. From the almost barren cliffs sprouted rather dejected junipers. We saw no goral, nor could we scale the awkward cliffs. We turned back to camp, I with my plants, Cranbrook with some birds he had shot.

CHAPTER XI

SPRING COMES TO THE ADUNG VALLEY

On March 2nd it snowed again at Base Camp. The snow began to fall before daylight and continued till noon, so that the whole valley was soon white. This depression, however, did not prevent the peach blossom from opening, nor did it injure the shrill yellow flowers of *Rhododendron seinghkuense*. But a large bush of purple *R. pankimense* in full bloom close to our camp was a sorry spectacle of sagging and shattered flowers. The michelia trees which were in bloom had their flowers blackened, but the dead flowers were quickly replaced by fresh ones. Many of the michelias were still only in bud and did not flower till a week later.

Michelia doltsopa, which resembles a magnolia, is commoner than most magnolias in these forests; commoner than *M. Campbellii*, *M. rostrata* or *M. globosa*. But it is not so common as the harvest of seeds it produces would lead one to expect, even on the assumption that the trees do not flower annually. What fate overtakes the seeds or seedlings of these trees? When the fruits are almost ripe they fall to the ground, though half the carpels may still be firmly shut. If you dry the fruits, the carpels presently open, exposing the brilliantly-coloured seeds. But in the festering darkness of the forest, the fruits lying on the damp mould never dry, and the carpels do not open.

They rot, and the seeds with them. Even so, scores of fertile scarlet seeds may be picked up under the parent tree, though there may not be another tree nor even a sapling in any direction for half a mile. Young plants of any of the Himalayan magnolias are far from common; I have seen saplings of *M. Campbellii*, but only close to a grove of the parent trees. What a contrast to the rhododendrons in the same forest belt, seedlings of which come up everywhere in thousands, on the ground, on rocks, on the moss-covered limbs of trees, and especially in every artificial clearing. There is no numerical relationship between seed-production and abundance of the species.

According to the calendar, spring begins on March 21st. But we observed authentic signs of its approach long before then. It is only between 6000 and 9000 feet altitude where there are many deciduous trees that one can speak of such a season as spring. Down in the jungle there is no spring and hardly a winter. Up in the high alps the spring flowers do not come out till June, when the snow melts, and almost immediately it is high summer.

On February 25th we saw bats and also swifts, flying high. They were cleaning up the flies which were already becoming rather a nuisance; a few butterflies were also on the wing. By the end of the month, maple saplings were beginning to open their leaf buds, and a *Litsaea* was beaded with scented yellow flowers which attracted many insects. Perhaps the flowering so early as February 15th of a primula might be considered as another delicate hint that spring was on the way. But the said primula (*P. dumicola*), for all its precociousness, was disappointing.

It was a woodland rock-plant with tiny pinkish-mauve flowers, and it grew on shaded rock-faces in moss and mud and was not uncommon up to 7000 feet on the sheltered side of the valley. I also found it scattered along a jungle path which led to some fields. Though a poor little inconspicuous thing, it had its virtue. The soft, hairy leaves were delicately fragrant, recalling some of the pelargoniums. But this faint fragrance was not always perceptible and not at all permanent.

I found another primula some days later, but only a single plant. Search as I would, and I searched long and far round our base camp, I could not find another. Then I got quite exasperated. The thing became an obsession; almost every excursion I undertook was with a view to discovering more of this plant. For primulas are the aristocrats of the alps, and I am always on the look out for new ones. Moreover, where there are primulas there are usually other desirable alpines. I need not have been so excited. In the first place, the plant itself was no more than a form of *Primula sino-Listeri*; secondly, its real home lay far up the valley where in May I found plenty of specimens. The one at Base Camp was an accident.

Then came the snowstorm of March 2nd and the flags of spring flew at half-mast over the slain. Meanwhile the exotic-looking *Rhododendron stenanlum*, a twisted tree with a smooth copper-red bole, the colour of an arbutus, and sleek dark-green leaves symmetrically crowded at the ends of otherwise rather barren stems, had come into bloom. The funnel-shaped flowers are a rather anaemic purple with a sick green flash near the base; and yet, such is their beauty in mass at moderately close quarters, that the tree resembles a sunset cloud. Such progress had been made already. Trees and shrubs including six kinds of rhododendron were in vivid eruption. *Michelia doltsopa* was still a fountain of white blossom in the forest, and the nozzle-shaped buds of a cinnamon were throwing out fine jets of foliage which, drooping over, seemed to fall back again in a shower of silver drops. Breaking leaf-buds, lacquered and bronzed, can be very beautiful. The temperate rain-forest was transformed before our eyes, as films of colour passed like the fleeting shadows of a windy April day over the trees, making them gold and jade-green and grape-purple. As for the rhododendrons, which from 6000 feet upwards form an increasing proportion of the forest, their leaf-buds generally break as soon as the flowers are finished and not before. But on bushes which do not flower the leaf-buds may break at the same time as the flower-buds. Consequently, in severe weather, non-flowering plants may be badly injured through having their young leaves cut, while flowering plants are merely spoilt. Therefore, if there is any suspicion of 'softness' in a rhododendron grown in Britain, the longer it can be kept under glass before it reaches flowering age and the sooner it attains flowering age the better.

It is difficult to say how far one could compare spring in the Adung valley with an English spring. When we first arrived at Tahawndam, and I saw masses of rhododendron and sixty-foot-high michelias in bloom, I considered we were a month ahead of England. But after three weeks and two injurious snowstorms I was not so sure. Apart from the considerable number of evergreen trees and in spite of a few trees and shrubs in flower the valley in early March still had a lean and chilly look. But this was not surprising. In the Burmese Alps November and December are fine months. Very little snow falls before January, and most of that melts, at least below 12,000 feet. Then the bad weather begins. Throughout January, February and March snow falls frequently and for days at a time. This snow is soft and woolly; it cannot consolidate; and, the slopes being precipitous, avalanches come roaring down into the main valley, piling the snow up in high mounds which take months to melt. Thus in June we have the paradox of the main valley in the alpine region still buried under snow, and the steep gullies above it on either side, especially those which face west or south, brilliant with alpine flowers.

This accumulation of snow in the alps during the early months of the year controls the air temperature of the lower valleys, down to about 5000 feet. Below that level the warm air slowly rising from the jungle prevails. Of course summer grows shorter and winter longer as we ascend the mountains; but until the permanent snow-line is reached, at about 16,000 feet (15,000 feet in sheltered gullies), there is always a summer, however brief. Above 10,000 feet there is no spring; it is either summer or winter, with a short intercalary period which might be called autumn.

But at Tahawndam spring faltered more than once. On March 3rd I find mention of peach trees in my diary, where I remark that the snowstorm of the previous day has not prevented the peach bloom from opening. A fortnight later the peach trees were in full bloom all

round the village, thrown into sharp relief by the young green wheat. On a fine day even the shabby huts of the Tibetans, surrounded by pink blossom, looked almost joyous. But the peach blossom was short-lived.

At the end of March, in the dense thickets which lined the river bank, *Pyrus* 'Goldbeam' was a beautiful sight. This is a large spread-eagled shrub, with buds of two kinds — inflorescence buds, containing both flowers and leaves, and pure leaf-buds. The former open first. The great black bud is sharpened to a silver point like a polished dagger, as the young leaves come out, closely followed by their attendant flowers. When these leaves are fully expanded, but before the flowers open, the true leaf-buds break, sending out a sheaf of purple plumes. Finally, the flowers open. They are cream-coloured, with amethyst anthers set like jewels on their tiny trembling stalks, and fragrant as meadowsweet. A golden haze of woolly hair envelops the whole inflorescence, like a spider's web. On the under leaf surface it takes the form of a fine skein, and as it sloughs off in a golden cloud it exposes a layer of silken silver hairs. Eventually these also fall away, leaving only the bald green leaf-surface. Occasionally this beautiful beam grows as an epiphyte on giant trees.

But it was not the goldbeam which made the peach look almost dowdy; it was the Carmine Cherry. This, the most magnificent hardy flowering tree I have ever seen, is intimately related to *Prunus puddum* — perhaps only a form of that species. On March 20th, close to our camp, I noticed a big cherry tree about to flower. Two days later it was in full bloom. It was quite leafless and just a mass of blossom, stark crimson. For a minute I stood before it, unable to speak a word, drunk with the glory of it. It was not to be believed. When the everyday world came back to me, I was in doubt for a moment whether I wept, shouted, or said a prayer. And then I turned to Cranbrook and said 'Golly!' in a sort of awed whisper.

Prunus puddum, as it grows in the Adung valley, is one of the largest of the deciduous trees, only the elm outstripping it. It grows eighty to a hundred feet high, and its branches have a very wide spread. The ruby-red flower-buds appear about the middle of March, in compact clusters towards the ends of the branches, and the tree is swiftly transformed into a frozen fountain of precious stones. As the buds open the stalks lengthen till the flowers are hanging down. Then the whole tree bursts suddenly into carmine flame. To see the setting sun through its branches when the tree is in full bloom is a thing not easily put out of one's mind.

There were only scattered trees along the river bank, and all of them on the far, sheltered side, difficult to reach. But in the forest, up to the 7000-feet ridge, the carmine cherry stood out like beacon fires. The flowers lasted about a fortnight, and in the middle of April the leaves began to appear. I never saw the ripe fruits. When we returned to Tahawndam on November 2nd they had all fallen or been eaten. The trees were leafless and hard to recognize, and I had to search the ground under the trees for seeds. I put the village children on to this job, and after much effort secured about a dozen good seeds. There are said to be two forms of *Prunus puddum*, a very

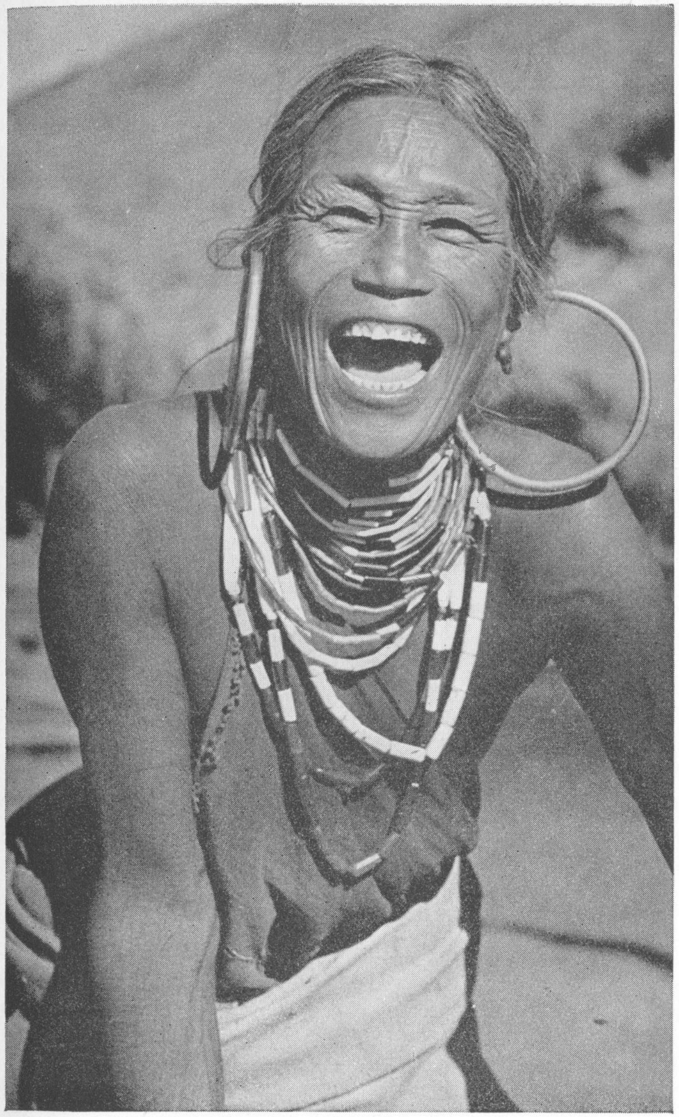
big tree with crimson flowers, opening in March (my 'carmine cherry'), and a smaller white or pink-flowered tree, flowering in November. I have never to my knowledge seen the white-flowered form; but the carmine cherry is widely scattered, in northern Burma, Assam (Naga Hills) and Zayul, in south-eastern Tibet, flowering any time between February and April, according to altitude.

One of the first signs of spring in the Burmese Alps is the rising of the rivers due to the melting of snow. Up to the end of March there was no appreciable change in the Adung. If it rose a few inches after a wet spell it would fall again in a few days. If the water grew turbid after a storm, it would run 'gin clear' again the following day. At the end of the month the river suddenly rose a foot during the night, and our spill-way filled rapidly; it became impossible to reach the island without paddling, still less to walk dry-shod up the channel. The Darus promptly set more fish-traps.

Just opposite our camp the river widened out and was comparatively tranquil, or at least unbroken by rapids. But even here the current was fast, and the water being waist-deep, we could not ford it. Immediately below, the gradient increased and the river plunged furiously amongst large boulders. At the head of the island was another big rapid, and then came another tranquil stretch as far as the gorge. In full flood the Adung river must have been a magnificent sight, but we never saw it. We were far up in the alps then, where one torrent was much like another.

Multiply the rise of a river like the Adung a hundredfold, and you get a faint idea of the Irrawaddy at Myitkyina in the summer. The Irrawaddy has two periods of rise. In April it begins to rise owing to the melting of the snows at its source. At Myitkyina it sometimes rises several feet during a night. Throughout May it continues to rise as more and more snow melts. The second big rise comes at midsummer, and is due to the monsoon rains which deluge the huge basin from which the Irrawaddy draws its water. There is always some snow-water coming down the river, not only from the glaciers at its source, but from the many snowbeds hidden away in the northern alps, which never entirely disappear, though the pressure is not sufficient to convert the lower strata into ice and so form glaciers.

We were not the only people sensible of the coming of spring. For some days the Tibetans and their Daru slaves had been active in the fields, hoeing and burning, and the annual holocaust of the forest had begun. They burnt over both the ground newly cleared for crops and the exposed mountain slope which was useless for crops, but good for grazing. No virgin forest was cut down; only land which had been cultivated already was cleared, the trees which had sprung up (mostly alder) being felled with an axe. On the night of the new moon, March 18th, the Tibetans lit a bonfire, and a torchlight procession marched round the village, firing guns at intervals and whooping. Thus they greeted the season of fecundity. Next day they sowed the spring crops. After that, tireless activity reigned. Fences were put up to keep out the cattle; fields which had lain fallow were ploughed; weeds were burnt in heaps and their ashes scattered over the



A TIBETAN MATRON

land. The wooden plough was a toy, pulled by angular cattle which might have stepped out of a child's ark. The coulter is not even iron-shod, and only scratches the surface. Nevertheless there was a great to-do about the ploughing. The Tibetans, who own all the land under permanent cultivation, manure their fields with stable litter, dung, dead leaves and pine needles all mixed together.

One of the hounds of spring broke its trace about this time and did much damage. It was the headman's watch dog, a big, savage Tibetan mastiff. I was glad I was on top of a mountain that morning. The dog did not go on the trail; it simply stayed in the village and bit everyone who did not smell strongly of butter and was therefore presumably not a Tibetan. A quite harmless Daru, one of the village slaves, suffered the full weight of its displeasure. Twenty-four hours later he came casually into my hut, with three horrible wounds in his forearm, and two more in the buttock. He had plastered fresh cowdung on them, but despite that sterilizing treatment they were septic. I sluiced them out with permanganate and bound up the arm. The man never winced. Ten days later his wounds were completely healed. I envied the man his stoicism. But no doubt he owed his fortitude more to the fact that he was hardly conscious of pain than to a reasoned philosophy. That must be splendid for the individual, but fatal to the tribe. For who would bother to avoid pain which he did not feel? And the next victim of dog-bite might die.

I did not wish to be bitten, so I issued a warning to the headman that if his dog cut loose again and approached our camp it would be shot. He promised to keep it securely tied up in the future.

The local inhabitants seemed to be incapable of wielding axe or knife without cutting themselves. I had hardly finished patching a man whose rough and ready ways with an axe had resulted in him gashing his foot when another man came in with a half-severed finger. Casualties kept the clinic busy.

After the middle of March there was a distinct rise of temperature; and there was no doubt that the snow, which for so long had been visible from our camp, was disappearing. Even the weather improved — sometimes it was like a warm April day in England — and the trees responded. We had no more frosts, and on fine days the shade temperature would rise to over 70° Fahrenheit, like an English July.

There is perhaps an even greater fascination in watching the coming of spring here, where four-fifths of the forest is evergreen, than in a cold-temperate climate like that of England. As the green, or silver, or coppery flesh spread over bare branches, one became aware of trees one had not even suspected. Spring comes suddenly — and is over. You must be alert or it is gone. It is summer. The only way to keep pace with spring is to follow it up the valley to where it finally dies out into winter eternal in the high mountains. Here, by the end of March, the michelias were over. So was *Rhododendron magnificum*. But the carmine cherry glowed like hot metal, and many more rhododendrons were coming into flower, so that the daily-increasing number of birds did not go honeyless. More and more they called to each other in the morning.

At first it was mainly the Sibia, the 'five-note' bird, whose liquid notes were cheerful, though monotonous. The yellow-backed sunbird, though one of the first up in the morning, did not fill the valley with song. This sunbird was extremely active and never seemed to take a minute's rest. The Sibia, on the other hand, is a lazy bird. I often saw it sitting around for minutes at a time doing nothing in particular, just sitting. It would sit on the topmost branch of a tree, quite still, for no reason — and just sit and sit. On wet mornings it did not even utter its five notes, but sulked. Moreover, it is a buffoon amongst birds. Sometimes it would pretend to be a sunbird, clinging upside down to a stem. Being bigger and several times the weight of a sunbird, the result was that it pulled the branch down and lost its balance. Then, still showing off, it would try another trick. Going into the thicket it would peck off a raspberry and look all round with jerky movements of the head as much as to say: 'Aren't I clever?' and then drop the raspberry, as though it *had* said it.

Tropical birds are not great songsters, and though we were not by any means in the tropics, we heard few songbirds here. There was one, however, with a peculiarly flute-like voice. It practised in the early morning, and sometimes at dusk. Another handsome bird, coloured orange and mahogany, had a fine voice, like an English blackbird; it was at the end of April that I heard it singing. The first comers, in the dull February days, certainly did not sing. Voices improved as the weather grew warmer. On one gloriously clear moonlight night — an event so unusual that I noted it specially in my diary — a bird like a nightingale burst into song. I listened to it enthralled, although a nightingale at home only tires me.

By the time the catkins were swinging like tassels from birch and hazel and hornbeam; by the time the straining bracken had at last pulled the end of its own stem out of the ground — for the young stem is bent double exactly like a croquet hoop — and begun to uncoil its dimpled fronds; and before the crooked buds of Decaisnea had revealed their rather gloomy mourning green leaves — it had become almost impossible to watch birds profitably from my hut. But Cranbrook continued to observe and collect thrushes, bulbuls, wrens, redstarts, flycatchers and other visitors and residents. The carmine clouds of cherry and the yellow mists of *Litsaea* and the soft red lights on the young maple leaves had inspired him.

CHAPTER XII

THE RACKETEER PLANT HUNTERS

It was a disagreeable shock to discover that the villagers did not take their herds up the valley in the spring, because they were afraid of their neighbours on the other side of the range. Every summer when the snow melts, racketeer tribesmen, backed by Big Business in Yunnan, come into the Adung valley to dig up the bulbs of a certain alpine Fritillary;[1] and these tough gentlemen would cheerfully steal a few cattle by the way. They always visit Tahawndam to see what they can pick up. Sometimes they kidnap a girl or two or commandeer food or beat up the agricultural labourers. The timid Darus dare not show fight. Reprisals are out of the question because they have to keep on good terms with their truculent neighbours, on whom they are dependent for warm clothing, salt and cattle.

Thus the Adung valley Tibetans are decidedly worse off than their neighbours in the near-by Seinghku valley. Those mountaineers can and do take their herds to the Diphuk La pastures at the head of the valley without fear. But there is all the difference in the world between the Seinghku valley and the Adung valley. From the Diphuk La, which crosses the main Irrawaddy on the Brahmaputra divide, it is four long marches down the narrow, uninhabitable Di chu valley to the first village by the Lohit river in Assam. From the Namni La at the head of the Adung valley, a pass not on the main watershed, it is only a long day's march to the first Tibetan village. Moreover, half-way down there is a spacious alpine pasture where men can be assembled for a quick raid over the pass. Geography controls the fate of the two villages, Tahawndam and Haita.

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[1] *Fritillaria Roylei*, the Chinese *pai mu*. The bulb contains a drug much used in China.

I asked the scrawny headman of Tahawndam where he sent his cattle in the summer. It was obvious they could not remain in this fly-blown, fever-stricken death-trap; they would quickly perish. He pointed vaguely to the mountain behind the village and lifted his chin towards where the snow lay above the forest. Never having seen a path I wondered how they got there.

Immediately below the village a shoulder of the mountain stuck boldly out, dividing the Adung river from an eastern tributary. Prospecting along the foot of this shoulder one afternoon, I suddenly came on an obvious cattle path and decided to follow it up the steep face to the crest above, whence I hoped to look over the other side and see down the Adung valley. After I had climbed a thousand feet, the slope eased off and I came out on to a wide, grassy alp, bathed in sunshine. Across the brown meadow I saw a wooden hut. It was the first cattle range on the ascent to the high pastures. Pleased with my discovery I returned to Base Camp and that evening at dinner told Cranbrook what I had found. We decided to spend a long week-end there. The headman said there was no water, but we sent him up to look, and he found a trickle.

Leaving most of our gear behind at Base Camp we started off at 9 o'clock on March 25th with thirteen coolies and the headman, who carried his gas-pipe gun. The path was lined with white wood-anemones, ferns and violets. At the top we came out on to steep acres of scorched grazing-land, fiercely hot in the March sun, for the slope faced due south. Before noon we reached the bothy, between two patches of forest, vividly coloured with rhododendrons. The bothy was squalid, but Ba Kai set up his kitchen and slept there, while we pitched our tents on the slope and quenched a great thirst with cup after cup of tea, before taking a look round. After lunch the headman and coolies returned to the village, but we kept one man to cut wood and draw water from the little spring, half a mile away, the only source of water till the rains broke.

We were 2340 feet above Base Camp or about 8000 feet above sea-level. The first thing that struck me was that here grew many of the same trees which we had already seen along the river bank. Only they flowered later. There were pure stands of *Rhododendron pankimense*: the fringe of the forest where it peeped over the steep ridge was splendidly purple with its variable blooms. But rhododendrons did not do well inside the forest where the evergreen trees made it too dark for them. For the same reason there were no flowers such as you see in an English wood in spring. But wherever forest and grassland met along the crest of a ridge, there would be a bright foam of rhododendron blossom. Except in the deep ravines, the southern slopes had been completely denuded of forest, and the grass and bracken which had replaced the forest was burnt year after year. A few veteran pine trees with charred trunks, which alone remained to testify to the past, stood as a memorial to the dead. Thus the grazing was artificial and was constantly encouraged and renewed. Not until we had climbed another 2000 feet did forest entirely cover the slope. Above 10,000 feet, silver fir and larch appeared, still mixed with such broad-leaved trees as birch, holly and *Rhododendron hylaeum*. This last was in full bloom, though standing in a foot of snow, with its dejected leaves screwed into quills.

There is something rather primitive about *Rhododendron hylaeum*. A thick-set tree should not, one feels, display so sleek and almost glistening bark; it would be more appropriate if it were cracked. One does not expect the bloom of a youthful skin on a raddled old woman. There is an uncouth contrast, too, in the shrivelled leaves and the abandonment of blossom. The flowering of *R. hylaeum* is not at all inhibited by the snow. The flowers, ten or fifteen in number, are tightly compressed to form a solid bunch; each is of a delicate rose-purple or an almost-white shade with a crimson-ochre ostrich-plume printed on the upper lobe and a lighter mackerel spotting below. It is like a high, windy sky. The skeleton-like trees, covered with blossom, had an equivocal air. They were youthful, yet infinitely old, venerable and new-born. They might have stood there, crooked and crippled, from time immemorial, or they might have sprung instantaneously from the granite rocks amongst which they grew so boldly at the touch of a fairy's wand. No rhododendron can be described as

quick growing, but there is none more slow growing than *R. hylaeum*.

Between 8000 and 9000 feet the Himalayan blue pine, *P. excelsa*, meets the Himalayan hemlock, *Tsuga Brunoniana*, and a thousand feet higher the latter in turn meets and is presently entirely replaced by the Himalayan silver fir, *Abies Webbiana*. Within a belt not exceeding 3000 feet in altitude there is a complete revolution in the forest, from warm-temperate to cold-temperate. It is as though one passed in an hour from the warmth of Southern Europe to the long winter cold of Siberia. At 7000 feet altitude there are laurels, magnolias, cherries, oaks, maples, figs, peach, pine, *Decaisnea*, clematis, and a great variety of shrubs and smaller trees. At 10,000 feet, hemlock, spruce, silver fir, larch, and birch. Almost the only trees and shrubs common to the two zones are hollies, willows and rhododendrons, and these are represented by totally distinct species.

After supper on the evening of our arrival we sat outside our tent by a log fire. It was extraordinarily peaceful. The silence was almost positive in contrast to the noise of the river down at Base Camp, but every now and again the faint thunder of an avalanche across the valley would disturb it. In the next fan of silence we listened to an owl hoot. Dark against the moonlit sky, the mountainous spurs flared southwards. Their levelness was amazing; no peak rose or dropped a thousand feet above the general level, which was 16,000 to 17,000 feet. Innumerable ridges, separated by deep and narrow valleys, faded away into the distance. It was as though a vast plateau had been raked over by a giant. Were the Irrawaddy mountains before the glacial epoch an outlying portion of the Tibet plateau? Whether it were so or not, this riven country had once been a rolling alpine plateau without any forest.

Rhododendron bushes around the bothy were alive with birds, and Cranbrook said he would find occupation here for some days. Next morning, in the interval between early tea and breakfast, I watched along the edge of the forest for an hour, and saw scarlet minivets on the wing. The wood just below us was fringed with white-flowered andromeda, and this proved as irresistible to small birds as did *Rhododendron pankimense* itself. To it resorted the ruby-backed Dabry's sunbird, and my barwing (*Actinodura nipalensis wardi*), which I shot, to find abundant pollen on its throat and clinging to the bristles round its beak. As for the Yunnan Sibia, it still went in company before pairing off, and on one occasion I counted seven together. It was a foolish bird and played childish games like follow-my-leader, forming chains which wound their way through the bushes. It was probably the most abundant bird in the valley at this season.

We had a grand feeling of freedom up here on the open hillside whence we could see far down the Adung valley almost to the Seinghku confluence. A wall of mountains hemmed us in on both sides, but we could see the snow-covered tops of those across the valley and even the harsh granite fangs of the range on our side above the forest line. Down at Base Camp one suffered from something like claustrophobia. It was like living in a drain.

On March 26th we followed the cattle path up the grass slope on to the ridge and thence through a belt of dwarf, close-growing bamboo (*Arundinaria*) amongst which bushes of a pleasant but strongly aromatic-leafed rhododendron appeared at intervals. I never saw it in flower; but it was probably *R. desquamatum*. We ascended the ridge for half a mile into the upper forest, and only turned back when the snow became deep. The silence of winter stayed here; there were no flowers and few birds, for the berries were all eaten. Even the rounded trees of *Rhododendron arizelum* showed no sign of life. In the thickets I noticed *Rhododendron cringerum*, *R. vesiculiferum*, and *R. selense;* but their leaves hung stiff. It was below, not above, the week-end cottage that the wand of spring had touched the forest. Even *Rhododendron sino-grande* at 9000 feet was not in bloom till the second week in April. The spur below us which plunged down to the river was forested where it faced Tibet and the snow, but grass-clad on the opposite slope where it faced towards Burma and the sun. You could scramble along the steep rocky crest which divided these two worlds. Here grew bushes of barberry, with fasicled leaves and lacquered sealing-wax-red stalks ending in clusters of shining yellow flowers. The carmine cherry and *Michelia doltsopa* grew in the forest but were not abundant: this was the highest I saw them, about 7000 feet. *Rhododendron stenaulum* was in full bloom some days after its part-worn corollas had carpeted the earth in the valley. It was certainly drier where our camp stood than on the north forested slope, though the grass was dewy at dawn. The trees were covered with long streamers of lichen, instead of moss.

Great bunches of mistletoe, a red-flowered loranthus and a white-berried viscum hung from the oaks. Common also was the epiphytic, yellow-flowered *Rhododendron chrysodoron.*

After an excursion into the forest and a vain pursuit of a shy ratufa, one day I returned to camp to find everybody greatly excited. Coolies had arrived from Fort Hertz with rations and mails: our anxiety was over. In charge of the coolies were a *pyada*, or local policeman, and our latest servant, Mano. Mano looked sick and admitted to fever. He was a quaint fellow with a flattened face and a wry smile. His skin looked like dried washleather, and he gave you the impression that he was lined internally with the same material. He crackled. We liked him for his pleasant manners and studied determination not to let us down by his sickness; but he certainly ailed. He seemed glad to have come up with us after his walk of 150 miles and pleased to have a well-paid job; but we quickly discovered that he knew little Hindustani and less Adungi. He called himself a Chingpaw, but we suspected that was just his way of being superior. He looked like a Nung. There is a constant drift to the right in the Irrawaddy jungle. The oppressed Hkanung or Daru goes west to Fort Hertz and becomes a swashbuckling Chingpaw; the astute Chingpaw trails south to Myitkyina and blossoms out in the bazaar as an elegant Burman.

The rations included ten bags of rice and two bags of flour, dry goods enough to keep us all for another three or four months. As for letters, it was just a month since our last mail came in, so we expected a good deal. There, however, I was disappointed. True, I received numerous envelopes, but they nearly all contained bills or those mysterious statements from one's agent on the coast which say: 'Sir, Your account has been debited' — for something of which you are unaware. This leaves you impotent, you cannot even tear up the gruesome thing and wait patiently for a first reminder. Meanwhile, your account dwindles mysteriously. I always used to wonder how I managed to spend so much money on an expedition. Now I knew. My account was debited.

There was a reminder, not so polite, from the Police Department, Rangoon, that Form XYZ/M (Arms Act, 1901) had not been complied with, and would I kindly call at Headquarters two months ago and register certain arms. There was an invitation to lunch with the G.O.C. Burma Division for the Saturday after we had left Rangoon. It seemed almost ironical to write a polite refusal, though courtesy demanded no less. Boo had written to say she was enjoying herself in Burma and was shortly leaving for home. Most of our English letters, however, were written about New Year's Day, and had just missed the previous mail sent out from Fort Hertz. They had been lying in the post office, accumulating week by week for five weeks, and were not at all up to date.

The coolies who had brought the rations were returning to their villages down the Tamai next day; only the *pyada* had come the whole distance from Fort Hertz. He was a lean youth with a cheerful round face, a depressed nose and intelligent bright eyes. In his khaki shirt and 'shorts' which showed off the black garters of cane rings below the knee (for he marched bare-footed and bare-legged) he looked very alert indeed. A scarlet pugaree, through which his stiff black hair sprouted rebelliously, was his only uniform and served to remind slothful jungle tribes that he represented the Law and was not to be trifled with.

We spent a busy afternoon writing letters. Meanwhile the *pyada* and the coolies had returned to the village; there were no sleeping quarters at the week-end cottage. At dawn we sent the liaison coolie down with our coast and home mails. He returned later, bringing us some fresh milk in a wooden bucket. So on March 28th our mail started on its long journey to England. It would take twice as long to go from Base Camp down the Irrawaddy to the coast as it would to go from Rangoon to London *via* Bombay. That seemed strange, and it impressed me with a vivid realization of how little our mechanical transport system has penetrated into the interior of Asia. There is no short circuit for the trade current, save only the Trans-Siberian railway 5000 miles to the north. India, Malaya and Indo-China are just limbs articulated to the trunk by great rivers whose waters have laid down such limitless plains that a network of communications has sprung up across them. But where those limbs join the trunk, along the southern ranges of the Asian plateau, there are no communications. We were not inside the dead heart of Asia, only in its still living, quivering cortex, but this is the most untravelled region of all. A combination of perpendicular mountains and rain forest means rough travelling. A gash here and there lets out a river; a high pass here and there leads to another mortal gash. We were as far from the interior plateau on the one hand as we were from the exterior plains on the other.

After four days of what *The Times* weather-forecast would call 'bright intervals', continuous rain set in. This was a blessing, since the spring, our only source of water, was almost dry. It turned cold, with day temperatures of under 50° Fahrenheit, dropping only a few degrees at night. Vegetation is more varied and luxuriant in regions where the daily and seasonal range of temperature is moderate, because under such conditions a higher constant humidity can be maintained. In summer the daily range of temperature in the Adung valley rarely exceeds 40° Fahrenheit, nor is the seasonal range great.

The grass showed no trace of green as yet, so that the cattle had not come up from the village. Even at the end of March the hillside was still honey-brown, chequered with charred patches. On sunny days men came up and lit bonfires, which swept over the hillside, burning themselves out along the edge of the evergreen forest, more quickly as the rain quenched them. The smoke mingled with the rain mist which rolled up the valley. The cattle were due in June, by which time the charred places would be covered with a film of green; slowly they would graze their way up to the alpine region.

The clearing of the forest exposes enormous cracked slabs of granite which the weather chisels into bizarre shapes. Pine trees and shrubs spring up amongst the stones; I noticed berberis and holly. In a similar rock exposure I picked up many scarlet seeds of a late-flowering evergreen spindle-tree. On the fringes of the forest above 9000 feet grew a variety of the crimson-flowered *Rhododendron neriiflorum.*

We had already overstayed our leave at the week-end cottage. The month ended as it had begun, in pouring rain, and we decided to return to Base Camp. Early in the morning we packed up — and had scarcely finished breakfast when the Tibetan and Daru coolies arrived. Some of them had come several miles, and climbed 2000 feet. It took less than two hours to descend, and we were home by noon. Half an hour later we sat down to breakfast. There was less rain in the valley; it was much warmer; and many new trees were in flower and leaf.

The Tibetan headman had proved himself to be a man of influence and authority. He had only to command, and the Darus obeyed. He was their king. When I paid over the day's wages to the Darus, the headman seized it. He would return some of it later, of course; he was only a temporary bank; and anyhow the Darus couldn't buy anything with it. But I was thankful for the system of forced labour. Had each man been independent, I would never have got transport at such short notice. It was not for me to find fault with an arrangement that satisfied everybody and worked well — though I felt sorry sometimes for the small girls who were called up.

CHAPTER XIII

WE SET UP AS DOCTORS

A FINE April day in the Adung valley was like a June day in England, but hotter. Though we were 6000 feet above sea-level, our latitude was that of Foochow in China, or Florida, or the Canary Islands. Yet, so far from the coast were we, it must have been unpleasantly hot but for the heavy accumulation of snow above us. That chilled the air which flowed up from the southern valleys; it also precipitated the everlasting mist and rain on the hills. Much heat was absorbed in melting the snow, and the resulting chill was enough to precipitate all the invisible vapour as visible mist and rain. Thus the atmosphere was always moist. But for this air-conditioning we must have been roasted.

Day by day the river rose. Familiar rocks disappeared one by one. The water grew turbid. At the end of April we could not cross the backwater to our island. It was cut off for six months. But the rainy season had not yet begun. This was spring — the 'hot weather' in India. The monsoon would not break for two months.

Every day Tibetans and Darus, hearing that we had a stock of medicines, called for treatment. Their ailments were many and varied. Our hut began to resemble the out-patients' department of a hospital. They came with fever, bites, cuts and wounds of all degrees of severity. My practice expanded rapidly; and there were no fatalities, at any rate in the consulting-room. The panelpatients paid me in kind, and the larder benefited, butter, *tsamba* (roast barley-flour) and eggs being the chief offerings. Nor was meat lacking. Two village headmen down the valley each sent us a fowl. The headman of Haita, who had befriended me five years before when I was in the Seinghku valley, sent his son to inquire after my health. He brought us an immense lump of vintage butter and twenty-five eggs of which several were edible when hidden in an omelette. The local Darus also brought us supplies: they wanted silver with which to buy cattle. One evening a Daru brought me a fine tragopan pheasant, for which I gave him a handful of red glass beads, some scarlet thread, some black thread, two needles and a treacle tin. Both sides were well satisfied with the bargain.

It was difficult to see birds now, so thick was the foliage growing on elm and maple, oak and walnut, poplar and ash. A lush growth of flowers lined the shady path which led to the fields; violets, bright yellow spikes of corydalis, white anemones, and enchanter's nightshade reminded me of England. In a dry glen above the camp lived a family of white-bellied squirrels; they played about on the ground sometimes, preferring the rocks to the trees. Only once did I see a chestnut-bellied squirrel here. Sometimes we saw monkeys. We ate a small Macacus monkey which the people brought to us, and I felt like a cannibal. It was a young one which had lost its mother and been chased by hunting dogs into the open, where the headman had shot it. The flesh was very tender and, I confess, good eating.

We celebrated the hundredth day of the year. At noon we opened a half-bottle of champagne, and for dinner we ate one of our precious apple-puddings. It was not a good pudding as we ate it, because Ba Kai put it into the stew-pan without tying it in a cloth, so that lumps of suet and apple bobbed forlornly in a thin emulsion, where the pudding should have been. We ate it with averted heads. There was also mushroom on toast. The headman brought us the mushroom, an anaemic yellow agaric as large as a soup plate, with white gills. When fractured, it changed colour slightly. It was entirely insipid, of the consistency of chewing gum and apparently harmless.

One morning the headman came to announce that he was going off for several days' hunting by himself. Cranbrook offered to go with him, but he shook his head; he was going far and would travel fast, he said. His reputation as a hunter had been rather eclipsed by Cranbrook's prowess, and he was jealous to reinstate himself in the popular estimation. Two days later he returned with a goral. With his dogs and his gas-pipe gun he had gone up the mountains and stalked his game on the cliffs. He had lived hard, working over the rocks from dawn to dusk, sleeping in caves, cooking his simple fare himself. We bought the heart and liver from him; it did not appear that the meat would keep even a few days, unless we carried it up the mountain and buried it under the snow. A week later he went off again. This time he returned with a serow and a goral, which put him well ahead of Cranbrook and entirely re-established his reputation. Once more he was the mighty hunter, and the local inhabitants were no longer hypnotized by Cranbrook's rifle. Indeed the headman hinted that if *he* were armed with that weapon, we should really *see* something. He rather disdainfully presented us with a morsel of meat, but by the following day it was as green as the forest and stank to heaven. But this was a festive season, and we had a glut of meat which we could not store.

Another day the village dogs chased a barking deer into the river and had it at their mercy. The men killed it — a female in milk, lately delivered of young. We paid five rupees for it. As venison it was hardly worth five rupees, but we kept the skin. Nor were these the only animals we acquired. All the jungle dwelling tribes are clever at snaring animals and know something of their habits. Their weapons and traps are crude, which is something to be thankful for; otherwise there would soon be no animals left. You need only settle down in the jungle for a time and let it be known that you want animals, dead or alive, and are prepared to pay for them, and the villagers will produce specimens. On one occasion they brought us a flying squirrel, its fur as soft as moleskin. These creatures are crepuscular and rarely seen. On one occasion I did startle one out of its daylight sleep in a tree, and sent it flitting along the edge of the forest seeking a safer couch. The flying squirrels live in hollow trees, sleeping by day. It was the felling of such a tree which led to the finding and slaughter of this pretty little animal.

The natives fell trees with axes, but the forest giants are too big for them and are left standing. Among the largest trees at Tahawndam was an elm, its trunk covered with a tangled growth of climbing plants and epiphytes.

Almost everything the villagers possess is made of wood, cane or bamboo. One day we watched the lama making a mortar for pounding grain. He had cut a birch log about twelve inches in diameter and three feet high and gouged out a hole at one end, using a soft ironshod chisel and a wooden mallet. Next he lit a fire of corn cobs in the hollow to burn out the heart. As the smouldering cobs charred the wood, he cut it away. The work was slow, but all household mortars, some of them fifteen inches deep, are made like that. They are used for husking corn. The pestle is a heavy wooden pole, about four feet long, which is grasped in the middle. Yet the husking is a woman's job.

Almost every day new birds arrived, and I learned to distinguish their voices, sad or gay or, with the brain-fever bird, maddening. Some of the most brilliant birds we failed to secure. There was one I particularly coveted, though I saw it but once, which means that it was either shy or rare — or both. Many birds I watched day after day, so that even if I did not know their names it was easy to recognize them again; but this one was something quite extraordinary. The top of its little head was bright chocolate, breast and throat vivid gamboge, the back dark, and round the eye was a white ring, giving the wren-like creature a fantastic pair of spectacles. This was all I could note down in the brief time I saw it.

One of the commonest birds was a black drongo, with scarlet beak and legs and a long, forked tail. It had the true drongo habit of darting off from its perch on a brief flight and returning to the same place again and again. The scarlet minivet was common now. What millions of birds there must be in this vast maze of valleys! And what immense influence they have on the vegetation! They are the agents which maintain the uneasy balance between insects and plants, attacking the former at all stages of their existence, some as pupae, some as larvae, some as perfect insects. They pollinate flowers directly in their search for honey and indirectly in their search for insects. They come and go in spring and autumn up the long alpine valleys which lead to Tibet. A few remain permanently in the lower valley. But the main impact of birds on nature is seen in the dispersal of seeds. The numerous seeds found in their crops gives some measure of the scale of this traffic. Hard seeds, such as Rubus, probably pass through the bird intact. They may, however, germinate more readily for the process, through the softening of the seed coat by acids.

The most significant service that a bird performs is to carry seeds long distances in a short time and to deposit them in surroundings not very dissimilar from those where they were found. The birds themselves have enemies. Snakes take toll of their eggs and young; they themselves have hawks and cats to fear. Man is not a serious enemy of theirs; but small boys harass them. At dusk one evening I watched a little boy trying to bring down a swift with a stone cast from a cleft stick. He sent the stone a surprising distance with this rigid sling. It whistled through the air, but the trajectory was uncertain, and the missile never struck.

Besides the deciduous trees I have already mentioned as being in full leaf, there were hornbeam, willow, *Pyrus*, fig, birch, *Cedrela* and others. Many of these were

in flower, but the forest owed its colour more to the varied tints of foliage than to flowers. The fig, for example, became a mass of ruby flames when the young leaves shot up from the buds. The almost circular leaves of *Macaranga*, supported vertically on long stalks poised aggressively, like shields thrust forward, were brick-red. The flowers of *Michelia doltsopa*, which had lit the grey valley with its bridal whiteness in February, were quite over, and last year's leaves were fast falling as the new foliage appeared; but the tree was never quite bare. The carmine cherry cast a rich glow over the foaming white rivers. The purple stems and gloomy green leaves of *Desaisnea insignis* struck a more solemn note: it was in flower before the end of the month, trailing long green tassels in the wind. *Helwingia* was another highly coloured shrub when its buds were breaking; and a spindle tree (*Euonymus oblongifolia*) covered itself with dangling chocolate flowers which seemed to be on wires. In the early morning every chocolate drop was jewelled with dew. The apple-green and soft reds of the maple-leaves, too, were lovely. One species had sharply pronged leaves like a slender-fingered hand. It was one of the last trees to cover itself, and the delicately red leaves, all in baby creases, uncurled themselves like starfish. There is a greater variety of form and colour in a mixed forest of this type, consisting of conifers, deciduous broad-leafed and evergreen broad-leafed trees, than in a tropical forest.

April 15th was Cranbrook's birthday. I gave him a cuckoo clock and then went off for the day, to climb the home side of the valley. When I returned in the evening we had a special dinner. Ba Kai was warned not to produce any more unusual dishes and contented himself with something between a mixed grill and a curry. Also I drank Cranbrook's health, and he mine, in a noggin of rum and hot water, a sleep-producing draught.

Early in April I found in bud a rhododendron which promised to produce magnificent flowers. I watched it with a jealous eye, visiting it every day. At the end of the month I paid it an evening visit as usual. To my horror, I found it had been cut down. Some light-hearted Daru, in passing, had slashed at it with his knife and that was the end of it. Had I found the culprit then, I could have found it in my heart to cut him down and cast him into everlasting torment. Yet he meant no harm. This rhododendron grew in a dense thicket on the river bank, and at once I set about searching for another. After several days I found another plant, also in bud. By the middle of April the buds had opened, into butterfly-shaped flowers, four and a half inches across. They were bluish-white, with a large softly yellow candle-flame spread over the upper lobe, and fragrant, especially after rain. As a plant, this rhododendron was marred by its wispy, straggling formation; but there was no denying the quality of the flowers. The awkwardness was due to its dwelling in darkness. For that reason I never could find it unless it was in flower; the stems were so thin and weedy, the leafy shoots so sundered, that it lost itself in the thickets. Even when it grew on a tree, it did not strive very hard to reach the light, as an epiphyte should. A closely-related, white-flowered rhododendron, which blossomed so gloriously in the tree-tops that at first I thought the tree itself was in flower, must have been a different species.

When the days were fine I went out with my camera, taking photographs of the flowers I found. The early mornings were very still and dewy; this was, in fact, the only time of day when still-life photography was at all possible. Later the wind began to blow, till the flowers danced. But I photographed quite a number of my treasures and found the corollas of the white butterfly-rhododendron the abode of bumble bees at dawn, but crowded with impatient small black flies later in the day. They seemed fascinated by the pale candle flame printed on the upper lobe as though reflected in a mirror. These delicate flowers, however, were fugitive, and the rain quickly ruined them.

Other low-level rhododendrons were now coming into flower. First the beautiful marble-white trumpets of *R. Taggianum*, whose reedy stems generally grow from the bole of some big tree. Secondly, the little box-leafed *R. insculptum*, with egg-yellow flowers. It is a pity the *Vaccinium*-like rhododendrons are so small and so difficult to grow; *R. insculptum* is the best and deepest yellow of any species known to me, much superior to the opaque lustreless yellow of *R. javanicium*. Thirdly, but not until May, the noble *R. Nuttallii*, whose enormous, pale, yellowish flowers hung out like inn signs over the roaring river. Juvenile plants of this rhododendron, not yet strong enough to bear the monstrous blooms, burst their leaf buds a month earlier and shot up plumes of puce-coloured leaves speckled with bronze scales. Last of all the valley species to bloom, flowering about mid-

June, was a bushy, big-leafed shrub, with bold bunches of flowers, which I suspect are crimson. Long before it flowered we had advanced our camp up the valley, into a climate where it did not grow, and when we returned in November it was long since over. On young plants, the deep green narrow leaves reached fantastic proportions. Even on mature, flowering specimens, I measured leaves sixteen inches long and four inches broad. Big leaves on a tree rhododendron have a beauty of their own, apart from the flowers.

The menace of dogs, savage, desperate from being kept tied up, and hungry, made me shy of visiting the Tibetan village; but the people themselves welcomed us whenever we cared to go. We paid a call one day, and watched the women making butter in a tall wooden cylinder. It is hard work forcing the wheel-shaped piston up and down through the squelching milk suds. We sat on the hard floor in the dark but too well-ventilated room, and buttered tea was poured out into wooden cups for us. It was a clay-coloured, oleaginous fluid, resembling oil fuel. But the Tibetans were fond of it, and consumed several quarts a day. It was less nauseating taken hot, with the butter well emulsified, than cool, when the butter drops floated to the surface and coagulated to form a thin scum. We ate puffed corn, which was good, and solid black millet cakes as large as cartwheels; and in return gave presents to our hosts, the lama and the headman. Even the Tibetan houses are only one-roomed but in other respects they are much superior to the Daru huts, which would be condemned for cattle in England.

Man is dwarf-like at the bottom of this deep valley in

the high snow-clad mountains. But, although few in numbers, and a comparatively recent arrival, he has already had a profound effect upon the vegetation. The great increase of bracken on the pine-clad slopes reminds one of what has happened in Scotland. Bracken may yet become a menace in northern Burma. As the forest is cleared, floods will become serious. The dense thickets of *Arundinaria* which spring up in some places are probably due to human interference, and the whole valley is lined at the base with secondary growth which has replaced the original forest.

After the crops have been reaped, or rather pulled up by the roots, the ground at once becomes covered with weeds, chiefly those with wind-borne seeds. Under cover of these weeds, woody plants begin to establish themselves, notably raspberry bushes and alder saplings. As these grow up, they kill out the weeds. The brambles and alder-saplings grow quickly and among them other trees gradually establish themselves. And so it goes on, in a regular sequence, one species replacing another and, more gradually, one type of vegetation replacing another. If the process were allowed to continue to an end it is probable that the original forest would come back — perhaps after the lapse of a century or two. On the very steepest slopes it would take a long time, because, when the forest is felled, the soil is washed away and naked rock comes to the surface; but on gentle slopes the cycle might be completed more rapidly. In fact, however, the cycle never is completed because when the secondary growth is sufficiently solid, it is cut down and burned again to make room for more crops. This takes six or eight years, and is the only rotation the jungle natives understand.

Early in April the reddish-purple flowered peas were in bloom and in May we had our first taste of fresh peas. The pea plants were very small and were commonly grown mixed with barley. Two kinds of barley are cultivated, besides oats. Another spring crop is buckwheat. All these are sown in winter and ripen about May. Just before the rains, millet, beans and maize are sown, and the last ripens in September. Altogether a dozen kinds of crops are grown in the Adung valley, thanks to the presence of the Tibetans with their more advanced methods of agriculture.

By the end of April, despite much rain or, at least, a lack of sunshine, the barley stood eighteen inches high in the fields and was almost ripe. The crops were thin, the straw poor and fungus disease rife. Great numbers of weeds grew amongst the corn.

I was much excited by the spectacle of burning-crimson rhododendrons high up on the opposite side of the valley, perhaps 3000 feet above our camp. Here the dense forest, combined with the steepness of the slope, was a formidable barrier. On April 10th I pointed the trees out to a Daru and told him to bring me some blossom. He went off and returned the same evening with branches of *R. neriflorum*, another crimson-flowered rhododendron which I had already collected; this species grew quite low down. I told the man he had not been high enough, and that he must go right up to the top of the ridge. So he tried again. This time he brought back splendid trusses of *R. sino-grande*, and of a gorgeous cerise-crimson

species I had never seen before — a tree rhododendron allied to the lovely blood-red *R. Thomsonii* of the Himalayas. At sight of this I decided to go up the ridge and see the tree for myself; besides there might be other unsuspected treasures there. Little did I guess what I was undertaking. Even now I cannot think of that appalling climb without feeling that I was deliberately cheated.

CHAPTER XIV

AN EXASPERATING CLIMB

Before visiting the home of the new rhododendron, I wanted to climb the Iris cliff, only a few hundred feet above the river. I had been to the Iris cliff already. There were no irises in flower then. Opposite our hut, where a thin stream of water flowed down the mountain, a slip had occurred and a narrow triangle of forest about 50 yards wide at the base and 1000 feet high had peeled away. One realized how easily in this shifting land the forest can be stripped off the mountain. There is little soil, even in the valleys. On the mountain it is a veneer. When it is waterlogged it may slip, as had happened here, and you see how thin it really is. The wounded flank had healed; but the scar remained. It might be several centuries before the rock would again be covered with forest. It might never be covered. Meanwhile a succession of *seres*, temporary plant communities, alder copse, bramble thicket and the like, would succeed one another, until the next slip opened the wound afresh, and the whole process of re-afforestation would start again.

I decided to climb the slip. It is hard work climbing a slip because the material moves so easily. It is also very bad for one's boots. I went up slowly. Down at the bottom I could step from boulder to boulder, but the higher I got, the smaller were the stones, and the

steeper the angle of rest. As the texture of the soil changed so did the vegetation, but, broadly speaking, there were two distinct belts. At the base were gathered boulders, and here flourished a dense growth of horsetails, amongst which had grown up hundreds of alder saplings. These would presently outstrip and vanquish the horsetails. Other shrubs well-established were *Leycesteria formosa* and more rarely *L. stipulata* (*Pentapyxis stipulata*), *Saurauja* and *Buddleia*. The shrubs, however, quickly thinned out as one ascended the cone and the gravel became finer. In the higher belt grew only herbs, conspicuous amongst them being white violets, flowering rush, and the little pink-flowered *Primula dumicola*.

Having conquered the slip I sat down to rest on a rock and looked down on the village a quarter of a mile below. Here I had a bird's-eye view of a strange sight. Beside a hut, three men appeared to be struggling, and I watched a figure detach itself and run towards our camp. He was closely followed by two others. I heard a dog barking. The pursued was certainly Ba Kai, our Burmese cook; the pursuers were certainly Tibetans. It was curious to be a spectator of a possible tragedy and be impotent to intervene. The chase ended; the pursuers abandoned their quarry as soon as he was clear of the village; and the incident was closed. What did it all mean? Well, I should find out later. Meanwhile I was thankful that Ba Kai could still run. He had not been murdered.

That evening when I returned, he came to me and complained that somebody in the village had smacked his face. Would I do something about it? I made inquiries and when I discovered that it was the headman's daughter who had done the smacking I stopped the case. No jury would have convicted the handsome young woman.

After a troublesome scramble I reached a track, probably made by wild beasts, which led through the forest. It was not much used and was difficult to follow. I had to bend double to get along at all, pushing my way under the branches of trees. I was soon wet through and covered with ticks. Eventually I reached the junction of two spurs, one of which diverged towards the Iris cliff. I was 1500 feet above the river when I started down the ridge in the direction of the cliff. I quickly reached very broken ground, and found myself in difficulties. A heavily-armed barberry grew astride the ridge. It had large holly-like leaves, resembling those of *Berberis insignis*, but the flowers were yellower and larger. *Rhododendron neriiflorum*, dabbled like blood along the lip of the cliff, was over, but several other rhododendrons were covered with fat flower-buds. A bulky bush of *R. seinghkuense*, perched on a rock, was flecked all over with its flattish yellow flowers. At the base of the cliff I found one thing that I sought — the pale bluish-violet *Iris Wattii* with yellow-crested falls. The ground was entirely covered with it; there were hundreds of plants, their long rhizomes lying uncoiled like neglected ropes.

Now I wanted to climb to where the new crimson rhododendron grew and see it growing with my own eyes. It was a climb of 3000 or 4000 feet, and here was no path. This time I took the Daru, whom I had

previously sent this way, as a guide. Some few hundred feet above the river we reached a terrace where he had his home, a small wooden shed open at the sides, filled with half-domesticated children, pigs and fowls. There was a little cultivation. So lost was this minute clearing in the immensity of the mountains that to call it squalid would have been to lose all sense of proportion. It was prehistoric. Above the hut we reached a ridge, covered with a dense growth of secondary forest. The Daru went ahead, cutting a path; it was slow work, for the ridge was steep. A few years before, the forest had been burnt off, and thousands of baby rhododendrons were coming up. It was a nursery of *R. magnificum*. The young leaves, which are very large, were wine-red. Other inhabitants of the nursery, also having wind-borne seeds, were birch and alder. And, to add to the congestion, there were thickets of a purple-leafed raspberry with large, pale-yellow flowers.

Still higher up, the entire mountain-side had been laid waste with fire, and the only trees left standing were rhododendrons. There was no path at all. It was immensely hard work scrambling along, sometimes almost crawling, or bent double, sometimes putting one's shoulder against the vegetable obstacle to force a passage through. I began to question whether we should ever reach the cliffs, which were still a long way off. We went on, keeping as closely as possible to the ridge, sometimes descending to avoid a knife edge, but always scrambling back again. After four hours' climbing we at last reached the base of the cliff, exhausted. Patches of snow lay about under the trees, and almost the first thing I saw on the warm, black, slimy earth, where the steep ridge swept down into an abyss, was a drift of the dwarf purple-flowered *Primula eucyclia.* This rare and charming little rock plant, with deeply cut geranium-like leaves, bears frilly flowers on stems an inch or two high. I had brought it home from the Seinghku valley a few years previously, but it has never done well in England, though it has flowered more than once. Yellow violets grew here, and an extraordinary little white flowered plant with nasturtium-shaped leaves, called *Asteropyrum peltatum*, made a carpet over the sodden earth. A brash of dirty snow which had slithered down the cliff lay in the scuppers, and round it grew dense thickets of bamboo grass and crimson *Rhododendron neriiflorum*, greatly resplendent.

Men had been here, for I noticed pheasant nooses and wicked looking *panjis* on which goral impale themselves when driven from cover by dogs. There is a great deal of cunning in the method. The hunters note which way the goral run. Then they build a small fence on the ridge or down the steep slope, leaving a gap, which is spiked. After a time the ground is hunted over again, and again the dogs chase out a goral, possibly the same animal. Following its accustomed route it reaches the fence, plunges through the gap, and impales itself on a spike. The pheasant traps are extremely simple, not unlike the traps country-boys make in England. A thin bamboo is bent down to form a spring and held in place by a trigger. A running noose suspended from the spring is spread flat on the ground, and grain sprinkled over it. The bird, pecking at the grain, puts its head in the

noose and presently steps on the trigger. Up flies the spring, jerking the bird with it, its neck caught in the running noose. The corpse dangles there till the hunters return.

We had reached the foot of a bare wall after a strenuous climb of 4000 feet: but we were hardly more than half-way to the top of the ridge as seen from across the valley. Higher we could not go. I walked along the foot of the wall in either direction, seeking to turn the vertical cliff. It was no good. The spur flattened out where it met the cliff, but it was still a spur with a deep abyss on either side. I could not leave it without crossing a ravine on one side or the other, and the ravines were not less than 2000 feet deep with precipitous sides. Again I tried the wall, hoping to scramble up a steep diagnonal crack. It was impossible. I was trapped amongst high cliffs and the abyss, 10,000 feet above sea-level, on a buttress of the world. It was too steep for forest, and there was every likelihood of rare plants seeking sanctuary here. But, if so, I could not get at them. Yet what plant could grow on this hard, unyielding crystalline rock? Nothing apparently. Nothing grew on the face, save where a joint or crack opened. And then I saw a most beautiful undershrub rhododendron, not quite a dwarf; it did not belong to one of the dwarf families. It had rounded, dark-green leathery leaves and drooping bells, exquisitely pink, in pairs; and there were but three trusses. Dare I pick a truss? There must be other plants. I picked a truss to take down in triumph and put in the press as a trophy. Then I hunted high and low for more plants and with success, though they were high up on the cliff. I didn't want them now, but I deceived myself that I could reach them when I wanted seed in October. In the crevices of the cliff, the sulphur-yellow-flowered mat-plant, *Diapensia himalaica*, grew luxuriantly, with anemones and the charming *Berneuxia tibetica*, which used to be called *Shortia tibetica*.

Meanwhile I had collected other rhododendrons: the big luxuriant trusses of *R. sino-grande*, its yellow bells with a baleful purple flash at the base: and the gorgeous cerise-crimson-flowered species which had first attracted my attention from 4000 feet below and which had inspired the climb. This proved to be a small tree growing on the precipitous flank of the ridge with *R. sino-grande.* I scrambled down to the only specimen within reach, and nearly fell over the precipice securing a truss. It was a treacherous place. *Rhododendron tephropeplum* and other small species sprawled on the lip of the ravine; they wallowed in the rich sodden earth, fat with the vegetable debris of generations of plants.

It was now time to start back. I was tired, and we had a long exasperating march ahead of us, even though it was downhill. I turned my back on the unclimbable cliff, with much reluctance, and started for the river. It had seemed a long way coming up, but it seemed twice as far returning. I thought we should never get down and marvelled how we had ever climbed so high in the time. Near the bottom my eyes wandered to the forested slope on my right, and I caught sight of a remarkable tree, covered with what looked like little plum-purple fruits but turned out to be flowers. A rhododendron? But was it possible? I had never seen

such a rhododendron before — soft willow-like leaves, snow-white underneath, and bunches of tiny cherry-red flowers with a blue-purple bloom, so that they changed colour as the light shone through or was reflected from them. Yet it needed only a glance at one of its dangling flowers to prove that it was indeed a rhododendron.

About 200 miles to the south-east of the Adung valley grows *R. Genestierianum*, which is described as a shrub twelve feet high with an inflorescence of twelve flowers. Here was, at any rate, a tree, albeit a small tree, and it was a poor inflorescence that did not carry twenty to twenty-four flowers. Yet it was unmistakably like *R. Genestierianum.* Most of the flowers were over, but the fully developed young leaves were a beautiful pale sea-green and easily the most conspicuous feature of the tree. A month passed before I saw another specimen some way up the valley. It grew scattered amongst dense almost impenetrable thickets of dwarf bamboo on the exceedingly steep flanks of the Adung gorge, at an altitude of 7000 to 8000 feet; and even at the end of May it was still in flower. *Rhododendron Genestierianum* is not common in the Adung valley. The chintz-pattern flowers were not easy to see in spite of the willow-pattern eau-de-nil leaves. But catch it on a steep slope with the sunlight shining through its dancing blood-red beads, and it is a startling object. Perhaps it was local rather than rare and its vertical like its horizontal range slight. In November, however, I found a colony on the river bank above the 8000 feet camp. The seeds are golden brown and tailless. It must not be assumed that because this species comes from 8000 feet, where snow falls regularly in winter, it will be hardy in England. The original *R. Genestierianum* certainly is not, though it has flowered under glass. But I doubt whether the plant is worth growing after all. It is striking for a rhododendron, but hardly beautiful in an ordinary light.

Before we reached the valley it was getting dark. There is no twilight in these latitudes. By the time I reached the river-bank it was dusk. I was wet, chilled, exhausted and more than a little disappointed, though I had a good many plants to put in the press before I went to bed that night, and actually we had only been eight hours on the climb.

The struggle along the ridge had intimidated me, and I did not want to repeat it. I had not enjoyed the climb and had expected better results. However, I did not suppose I should ever have to repeat it. Only later, when I realized that the pink-flowered dwarf rhododendron was really rare, did I have misgivings. I never found another plant. It was for that and that alone that I climbed the south ridge once more on November 9th. This time it took me nine hours. I had found three trusses of the pink-flowered rhododendron in April and seen other plants which I had supposed would flower later. I found them again now, but either they had not flowered or they were high up on the inaccessible cliff. Once more I sought to scale the cliff. I lacerated my hands and wrenched the sole off one of my boots as I slipped from a precarious hold. It was no good. Try as I would there was no way up the cliff. It was as impregnable and almost as vertical as the wall of the

Bastille. Moreover, the flowering specimen of the rhododendron I had worked so hard to get had set no seed. One truss of two flowers I had taken lightheartedly for the herbarium. The other two trusses, four flowers in all, hadn't produced a seed between them. I nearly wept. And then as I was on the point of giving up, hidden away in a crevice of the cliff I found one more plant. It had one capsule, and it was full of fertile seed. It had become a point of honour to collect seed of the pink rhododendron. Had it been a diamond as big and blue as the Koh-i-noor, I couldn't have taken more care of it. May it succeed! Yet, when the plant flowers in England, connoisseurs looking at it and reading the simple label, 'Rhododendron sp. (K.W. 9413) Burma 1931', will think of none of these things.

But this is the April narrative. We must turn back. I had told the headman we wanted to go up the valley as soon as the snow melted; also that we wanted huts built for us, one at the first confluence, altitude 8000 feet, where the river split into two equal streams from north and east, and the second at a point up the last river marked 12,051 feet on the survey sheet. I explained the position of these places to him, since naturally he would not understand a large scale map of the valley, and he made no mistake. On April 23rd, he and his men, armed with axes and a supply of food, left for the upper valley. On May 2nd he returned saying that the huts were finished; we could move into our new home any time we liked.

This was the critical movement. Once we could camp at 12,000 feet, I knew we could reach the source of the Adung river.

CHAPTER XV

THE ROAD TO TIBET

During our last fortnight at Base Camp, when the trees were in full leaf, we found several birds' nests. Besides the residents, many birds rested here for a few days on their way to the great rhododendron fields higher up. It was noticeable, too, that one saw more birds on a wet day than on a fine one: when the sun shone it was stuffy in the valley, and birds sought the shade of trees.

On May 4th, I counted ten species from the door of my hut. One was the noted songster with the orange throat; another was the Sibia; a third the fantail laughing-thrush (*Trochalopterum*); and a fourth was a little flycatcher with a grey throat and yellow breast. I also shot a bulbul. Certain birds pollinate certain species of rhododendron; and all the tree rhododendrons are *adapted* to bird pollination. One could always be certain of finding birds on the bird-cherry (*Prunus nepalensis*) which flowered in May. This tree was covered with hundreds of white flower-spikes like tall candles, giving it somewhat the appearance of a scrawny-flowered horse-chestnut, except for its very different leaves. Again, small birds were always busy among the raspberry bushes, whether they were in flower or fruit. Some of the raspberries had beautiful milk-white stems, due to a coating of wax.

By the beginning of April birds were busy building

their nests, and early in May I found a nest of woven hair, suspended from a bamboo. It had two eggs. Another nest, which I found in the making, had four. Though I caught sight of the bird — it had an orange throat, carmine beak, dark back, and barred wings with a hint of orange — I never discovered what it was. The nest was suspended over a path I used frequently, and after the bird had been scared off the nest several times it stayed away. Cranbrook also found several nests. But as usual the difficulty was to match the eggs to the bird. Unless one shot the mother-bird near her nest — and this I never had the heart to do, even in the interests of science — it was impossible to identify her with certainty.

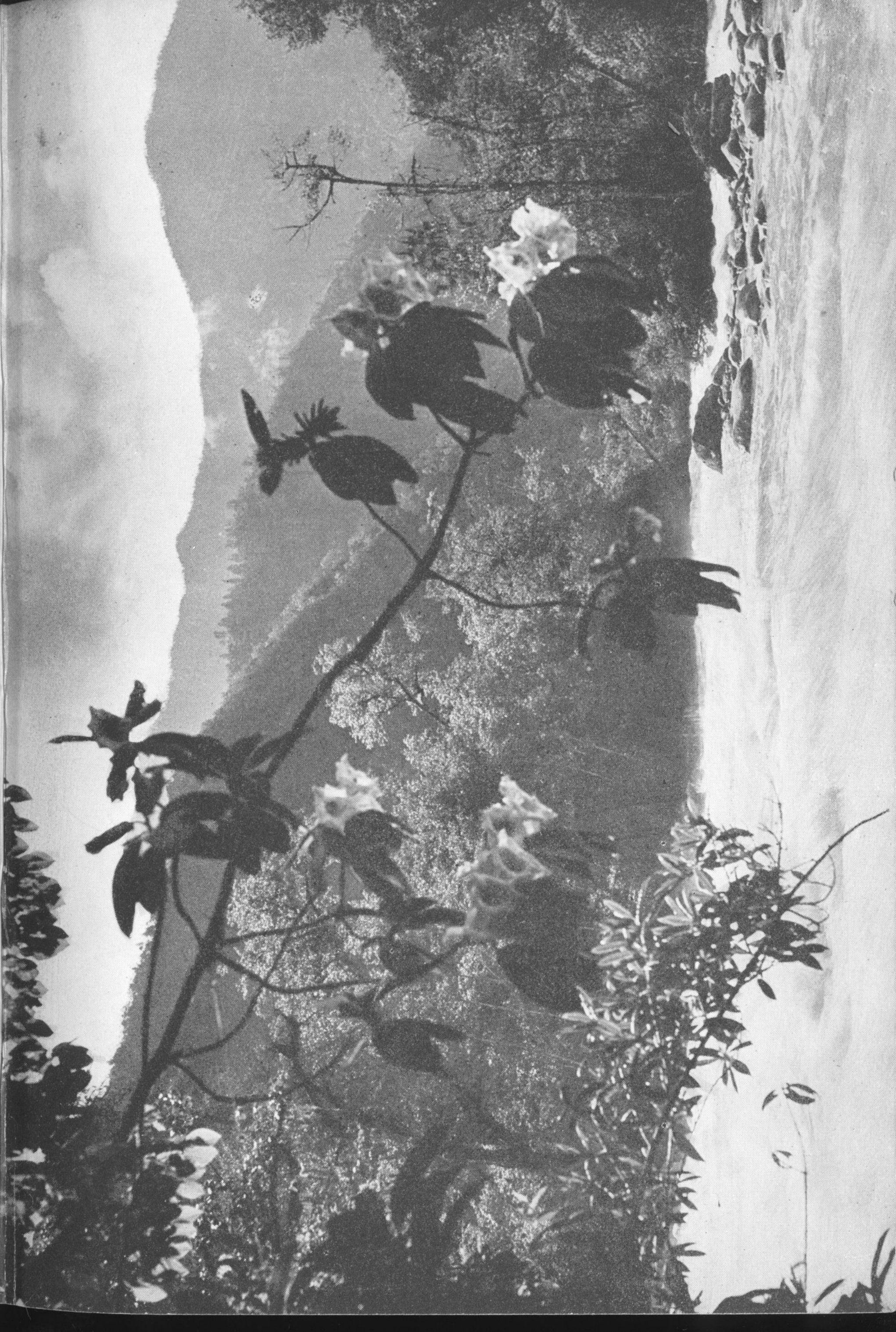
Now that the hot weather had begun, reptiles crept out into the sunshine, and we killed several small snakes. The commonest was a short chocolate-reddish reptile found in the forest, up to about 8000 feet altitude. We killed them, not from any vindictive feeling — for indeed, although I loathe snakes, this particular one is quite harmless — but as museum specimens, and bottled them in weak formalin.

On May 1st, a true, bright May Day, we took some lunch out with us and sat on the warm rocks in the bed of a stream not far from camp; and here I killed a venomous-looking viper which was also sunning itself. No doubt there are many snakes in the lower Adung valley, which is all the more reason for the birds to build their nests high up in the bushes, for snakes eat eggs as well as young birds. But these were the only two species we saw. We were all taking quinine now, several mild cases of fever having occurred in the village. I was particularly afraid of Mano going down: I gave him ten grains every few days and saw that he took it. One day I gave both him and Ba Kai twenty grains by mistake. It laid them out.

It was about this time that I began to feel the effects of the poisonous honey; for in spite of Cranbrook's and Mano's alarming experience I still continued to eat the excellent popcorn and honey which the Tibetans brought us. Even so, though I felt listless and lethargic more than once as the result of over-indulgence, I was never poisoned as they were.

The green peas were now ripe, and on May 10th the headman brought us some. We had had several dishes of wild strawberries, which, with condensed milk, were remarkably good. We had a lot to eat here that you cannot have on the Tibetan plateau.

The next incident was the flowering of that most flamboyant of all rhododendrons, *R. Nuttallii*. For weeks I had been watching the enormous buds swelling, until at last the scales fell from them and they bloomed in their full splendour. The bush grew on the river bank, and the scented flowers hung boldly out over the roaring foam-crested water, rare beauty contrasting with rare strength. The best shrub bore twelve trusses, each with from three to five — very rarely six — enormous, lily-like, scented flowers. The slender stems were bowed down with the weight of blossom. But *R. Nuttallii* seeks dark places and so grows lanky trying to reach the light. Sometimes, when young, it is epiphytic; but fully grown plants are too tall and top-heavy to stand without support from their neighbours and so generally cleave to the



[*facing:* RHODODENDRON NUTTALLII BY THE ADUNG RIVER

river bank or grow on a cliff. The flowers are rather variable, but more or less white, with a custard-yellow tinge (not the cold marble-white of *R. Taggianum*). More rarely they have a pale purplish-pink flush, and always they are sweetly fragrant. The young leaves are of a curiously dulled metallic purple, the metallic appearance being due to innumerable tiny scales, like flecks of mica. *R. Nuttallii* was the last rhododendron down in the lower valley that I saw flower, and the only one now left to flower was *R. Kyawi.*

While trying to photograph *R. Nuttallii*, with my camera set up at a perilous angle on the rocks around which the river raged, I slipped and nearly fell, taking the camera with me.

I would have been well content to remain at Tahawndam till the end of May, had I not wanted to see the alpine rhododendrons at their best. With the approach of summer and the monsoon, this frontier between the sub-tropical and warm-temperate forest was becoming more and more interesting. Moreover, the weather was fair.

Although the freshness of the spring colour was dimming, there was still a great variety amongst the forest trees. A species of Pieris was tipped with fiery scarlet, and the five-pronged leaves of a maple were opening like red silk parasols. In the sunshine they were almost cinnabar, but presently they changed to polished mahogany. There were other bright colours, especially the shining red-brown of *Prunus acuminata* and a Meliosma with tiny flushed crimson leaves. The fig, too, had turned a brilliant salmon-crimson or ruddy salmon. Not less enchanting was the terra-cotta of the young walnut trees, the cedar-wood red of *Clethra Delavayi* and several species of Lindera, especially *L. cercidifolia*, which had vinous purple foliage.

Even the climbing plants had colours other than green, though they hardly affected the landscape. A small vine had beautiful red leaves, clutching delicately at the tree trunks; and the fronds of a common forest fern (*Lomaria*) were a deep peach pink. Alone among trees, a species of Saurauja put forth leaves of a nondescript green. Most of the flamboyant colouring goes out of the leaves as they come to maturity, and all turn some shade of green; but the colour of the temperate rain-forest is never sombre or monotonous. In autumn many of the deciduous trees again take on rich colours, though only for a brief period.

The lovely blue pea, *Parochetus communis*, was flowering everywhere in the short grass. It is amazing to think that this plant grows well in almost any English garden and is perfectly hardy in Berkshire and even Middlesex.

On the very day, three months previously, when we reached Tahawndam, I had noticed a curious tree by the river, and I awaited its flowering with interest. In the first week of May its creamy-white flowers at last opened, and I could smell them fifty yards away, a rich intoxicating scent, reminding me slightly of hawthorn, but more cloying.

A cloud of insects in great variety skirmished round the tree daily, especially when the sun shone. On dull days the scent was less penetrating, and fewer insects came. I made a collection of flies and beetles here.

The May sunshine brought out many fine butterflies, such as swallow-tails, sword-tails, brilliant metallic green and blue Heliophorus, and a species of Junonia with blue and red bull's-eyes stamped on its wings. The sword-tails (*Pathysa*), their translucent wings like frosted glass with apple-green panels of Chinese silk inset, heavily shadowed and edged with black velvet, have an odd way of drinking. On sunny days I watched them settle on the mud to suck up water. The conspicuous proboscis was pushed vertically into the mud for about half its length, and the insect drew in water steadily for some minutes. But it ejected the water intermittently from the anal orifice at the same time, and in the space of four minutes it squirted out thirteen jets. Just before each ejection it expanded the anal flaps and shivered. At our next camp up the valley, 8000 feet, chains of sword-tails used to fly down-stream over the river on sunny days. I never saw any flying up-stream and often wondered what became of them.

Butterflies are always fascinating, and anyone who has collected them as a boy must be thrilled at his first sight of the wonderful tropical butterflies. Most species range far, and since they are so attractive and conspicuous many people have collected them all over the world. It is very difficult indeed, even in a remote place like the Adung valley, to find a new species, much more difficult than it is to find a new plant. When people are tired of cases full of dead butterflies perhaps millionaires will erect papilionaries, as they now do aviaries, and keep butterflies on the wing. The new Crystal Palace, if one is built, might be a papilionary.

Coolies were daily arriving at Tahawndam, at the headman's bidding, and as they arrived we sent them off up the valley with our loads. Twelve were on May 8th, five on May 9th. The headman rashly promised a dozen for the 11th, but none came, although we were packed and ready to start. However five were promised next day — and came. With only five coolies we could not both go, so Cranbrook stayed behind with Mano while Ba Kai and I started up the valley.

The distance to our new camp was only nine miles, but it took us three days to get there. It was nearly eleven o'clock when we started, and we camped at two o'clock, because the men said there was not another good camping ground for some distance. But one never expects to travel far the first day. We got as far as the gorge and camped in the forest. On a rock which stood high above the tumult of the river a splendid plant of the ivory-white *Rhododendron megacalyx* was in bloom. The forest trees here did not grow very close together, and the undergrowth, though six or eight feet high, was easily cut down to make a clearing for my tent. There were many gigantic cuckoo-pints (*Arisaema*). The solitary leaf which shelters the pitcher is like an umbrella, with three separate wedge-shaped lobes. Another species had a similar leaf, but instead of having three lobes it was composed of numerous narrow spoke-like leaflets, each drawn out into a sharp point. Thus it is more like a wheel than an umbrella, though it sheltered the pitcher just the same. In a wind, this rimless wheel oscillates to and fro, giving the impression that it is revolving very fast. In the autumn the club of the cuckoo-pint bears scarlet

fruits, exactly like our English 'Lords and Ladies'. The chief difference is that, whereas in English cuckoo-pint (*Arum*) both male and female flowers are borne on the same club, in Arisaema they are borne on different clubs; that is to say, there are separate male and female plants.

I have two of these quaint cuckoo-pints from Tibet growing in my garden. They are an everlasting source of delight to visitors, who are astonished to see the prayer-wheel leaf apparently spinning round. In the Himalayas there are numerous species, differing in size, colour, and shape of pitcher. But all of them fall into one or other of two groups: those with three-lobed umbrella leaves, and those with multi-spoked wheel leaves. Most of them grow in the forest, a few in the alpine meadows. The forest species occur scattered or in small colonies, but the alpine species usually grow in large colonies. One might expect a reasonable proportion of male plants to female plants, and no doubt the proportion *is* reasonable, though not by ordinary standards. I have frequently examined such colonies and noticed that male plants outnumber females by about six to one. Whole groups of male plants occur without a single female. Pollination is probably effected by small flies, but it must be a risky business.

After a rest, I followed the bed of a stream up to the base of the cliffs, where I had seen shrubs covered with blossom. The cliff, however, was covered with an almost impenetrable tanglewood, and I spent a furious and unprofitable hour in its assault, squirming and scrambling up through the dense growth, but having to confess myself defeated long before I reached the rhododendron zone. On the cliffs across the river I could see splashes of yellow which I took to be rhododendrons. Ticks were as common here as leeches were in the lush herbage down the valley, and I returned to camp greatly irritated.

It was very still in the forest; there was no wind. At first the cicadas made a terrible noise, like a machine shop working at full pressure; but after dark they stopped and only the booming of the river disturbed the silence. Next morning I was awakened by the harsh, jarring notes of a brightly coloured woodpecker. We did a fairly long march, and camped on a sandbank in a little bay of the river-bed. The place was alive with sand-flies, which bit venomously; otherwise it was a good camping ground. Considering that the river was a roaring cataract all the way, we ought to have ascended at least 500 feet; but according to the barometer the ascent was less.

By the afternoon a marked change had come over the forest; we had said good-bye to the warm sub-tropical valley for six months, and now entered upon a cooler region. Here grew *Magnolia rostrata* in full foliage, with its small flower buds showing; also enormous hemlocks, spruces, and pines, laurels, hollies, oaks, birches, and maples. But what pleased me more than anything else, because it seemed to be the most difficult thing to find, was a solitary plant of *Primula sino-Listeri*, in full bloom under a rock. It was the very plant I had searched for in vain at Base Camp.

May 14th was a fine sunny day, and the up and down march along a narrow cliff path was pleasant. It took us six hours to reach the big bifurcation, where the river split into two approximately equal halves, one coming

from the north, the other from the east. In a dry gully, with very steep banks, I found many plants of the elusive primula, and it was here that I eventually collected some seed.

I noticed scattered trees of *Rhododendron Genestierianum* still in flower and also *Magnolia globosa*; there was a lot of bamboo here, too. By far the biggest trees were the four conifer species, *Pinus excelsa*, hemlock (*Tsuga*), silver fir, and spruce (*Picea*). Only the oaks, amongst broad-leafed trees, approached them in size. *Rhododendron magnificum* was seen no more; its place was taken by *R. sinogrande*. But the common tree rhododendron in this zone is *R. arizelum*, a gregarious species with flowers which vary from red to pink.

A hut had been built for us on a platform just above the river, under the shadow of some vast conifers. They were like the pillars of some mighty temple of Pan — a dim colonnade, through which the light filtered as through stained-glass windows. I measured some of the spruce trees; the largest was seventeen and a half feet in girth, at a point five feet above the ground level, equivalent to a diameter of some six feet. Thus it would have taken three big men, holding hands at the full stretch of their arms, to have clasped it round. A hemlock measured eleven feet in girth. As to their height I could only estimate it, and many of the tallest trees had their heads blown off. Here and there a tree had crashed to the ground, and could be measured prone. One fallen giant formed a natural bridge across the turbulent river, and it was the only bridge. Sometimes the water swept over instead of under it, and before we left this camp it became impassable. Some of the tallest conifers may have approached the height of 200 feet, but no broad-leafed tree I saw attained anything like that height. Even the oaks, big as they were, looked stunted by comparison.

The gorge of the Adung had again narrowed, the cliffs on either side approaching to within a quarter of a mile of each other, though the fact that they were concealed under a heavy curtain of forest tended to give an impression of spaciousness. Actually the sides of the valley were steep, even precipitous, and there was little room between the bank of the river and the cliff. The path stayed on the left bank. Although the river had split into two, neither branch seemed less than the former whole; there were simply two obstacles where formerly there had been but one. Above the confluence the path turns sharply east and continues thus for several miles. The two rivers meet at right angles, with immense impact. The gradient of the valley then steepens, and despite the cushion of forest, which absorbs much of the noise, the thunder of the river rings loud. It was hard to believe that we were 8000 feet above sea-level. The lush undergrowth, the dense forest, the wealth of climbing plants suggested milder heights. But the shelter, and the perpetually moist atmosphere afforded by the gorge accounted for the vegetation. The country is a grid of high alpine ridges, averaging 16,000 to 17,000 feet, combined with a grid of deep valleys. In the upper part, where they are in direct contact with the alps, the valleys themselves average 12,000 to 13,000 feet altitude; in their lower half, where they are in contact with the sub-tropical country, they average no more then 6000 to 7000 feet, but even

here the mountain grid maintains a high elevation. The gradient of each valley of course decreases as we ascend, but not at a constant rate. There are places where the gradient is very steep for a short distance, followed by comparatively level treads, which may mark the sites of lakes. A valley is always apt to be over-deepened below the exit from a lake.

It needed only a cursory look round to realize that we had chosen the right place, indeed the only place, for our camp. I reached the confluence on May 14th. At first I slept in the new hut. But the rain poured through the thatch in such chilling streams that I changed my mind. I decided to pitch my tent and sleep in that, using the hut only for meals; and when on the 17th, Cranbrook and Mano arrived, I set the coolies to work retiling the hut with rhododendron leaves. Cranbrook was enthusiastic and liked the look of our new camp; but to me it was only a half-way house to the alps. He had had some difficulty in getting coolies at Base Camp, but had done in two days what had taken us three.

It is difficult to convey to those who have had no experience of this country the relationship or, rather, the lack of relationship between *distance* and *time*. There is probably no other country like northern Burma in the world. There is jungle as thick; there are mountains as high and steep; there are climates as humid and extreme. But the combination of all three is unique. If you take a pair of dividers and measure off on the largest scale map you can find the distance between our Base Camp and Camp One at the confluence you will find that it is about six miles. If we allow fifty per cent extra for windings, ascents and descents, which cannot be shown on the map, the distance is still under ten miles. To us who walked it that seems incredible, but it is true — on the map. But remember we had to walk. Now the standard rate of walking in England — not usually achieved in practice — is four miles an hour. If one thinks of walking, that is what one has in mind. Apply this rate, and the distance between our Base Camp and the confluence, say ten miles, would take two and half a hours, or at a generous estimate, three hours; and I have already said that we took three days over it.

Why? It is true that a native carrying a very light load on his back would do the journey in a day, but it would take even him a great deal more than three hours. We who took three days were on the road for sixteen hours altogether, including halts.

If you can, on the average, cover less than half a mile an hour, while expending more energy than it requires to walk eight times as far on a good road, it is obvious that a ten-mile march begins to assume formidable proportions. It means board and lodging on the way — tents, food, transport. Remember this is no *tour de force*, no momentary effort. The plant-explorer is living and working under these conditions for months on end, and as he ascends higher and higher into the alps the strain becomes greater. Do what he will, a progressive deterioration sets in. Thus it came about that at the very time when we most needed all our strength and energy, we were least fitted to respond. Later I shall tell how we did respond.

Cranbrook told me that on the first night they had

slept in an enormous natural cavern, under a fallen rock, where fifty men could have found shelter. It was off the path, a few hundred feet up the slope, completely hidden from the slope below, so that I had not seen it. From the number of shelters we passed, the rocks blackened by smoke, I formed the idea that there was a definite route up the valley. These were no hunters' caves. The track, too, though not good, was unmistakable. We were on the road to Tibet.

CHAPTER XVI

AN ENCOUNTER WITH A CAT-BEAR

HITHERTO we had traversed forest in which rhododendrons were scattered. Now we entered a new zone where they began to dominate the forest landscape. One cliff, which faced the cold east, was painted pink and yellow for 2000 feet with flowers of *R. arizelum*. Looking squarely at this cliff from the river, one saw about 250 acres of rhododendron blossom. There were no big trees on the cliff, because it was too precipitous to support them; it was a solid mass of *Rhododendron arizelum*, with here and there a rose-purple splash of *R. timeteum*. The trees stood touching one another, and there must have been fifty thousand of them in bloom together.

Lining the river banks was a very different species, the sticky-haired *R. vesiculiferum*. It is not a tree, but a large shrub, and the flowers are some shade of pinkish-purple, with a dusky blotch, like a daub of plum juice, at the base of each. Another common flowering shrub on the river bank was *Enkianthus campanulatus*. It was smothered with carillons of little brick-red bells finely striped with yellow lines; when the sun shone through them they glowed like hot blown glass. Thus the view looking down the foam-crested river was extremely gay, although inside the forest gloom prevailed.

We had not been many days in camp before the whole place was overrun with brown mice. It was the more

annoying because they occupied space in our traps which we wanted for other and handsomer beasts. For some days we could catch nothing but brown mice. At last Cranbrook broke the spell by catching first a vole, and then a shrew. As for birds, there were plenty in the forest, but they were more often heard than seen. Long-tailed magpies sailed from tree to tree, a tiny chestnut-headed wren with canary-yellow throat and dull green breast was common, and I noticed sunbirds, minivets, woodpeckers, crows and babblers. But like ourselves, most of the birds here were temporary visitors, anxious to resume their journey upstream. For the time being at any rate there were honey-secreting rhododendrons in abundance, and I saw a sunbird visiting the flowers of *R. arizelum*.

But large insects such as bumble bees, and a villainous blood-sucking fly as big as a bluebottle, called *Tabanus*, also visit rhododendron flowers. I noticed *Tabanus* particularly, because we were always swatting him in camp; and every one I examined carried enough pollen on its head to pollinate a wilderness of rhododendrons. So this clumsy fly was a regular rhododendron visitor? It gave a painful prick when it pushed a saw-edged bayonet-like instrument into one's flesh; but luckily it was a big insect, and an easy target. One can only hope that in introducing these rhododendrons into Britain one is not at the same time introducing all their attendant pests. Sandflies were another menace, especially at night; and ticks troubled us by day; but luckily we were above the leech level.

We saw striped sandy squirrels (*Tamiops*) again. They move very quickly, and I was astonished to see one upside down running along the underside of a perfectly horizontal branch. The English red squirrel cannot perform that feat. On another occasion I watched one run vertically down a tree trunk, turning neither to the right nor to the left. It had a ball of moss in its paws and appeared to be tearing it to pieces, as though it intended to build a home.

But the most pleasant encounter I had with a wild animal occurred one day when I was on my way down a steep rocky slope. In the fork of a small tree, somewhat isolated from its neighbours, I suddenly saw, almost level with my eyes, a red cat-bear. On catching sight of me (it must have heard me first) the cat-bear stared, but showed no fear, nor even surprise; still less did it hurry away. Very deliberately, staring at me with its large onyx eyes, set in white semi-circles, it followed my movements. At first it appeared to be measuring its distance from the nearest big tree, then from the ground. But the tree in which I had started it was a pygmy amongst giants, and it could not reach a bigger one without first descending to the ground. The cat-bear took in all this at a glance, without change of expression, and moved without haste. Not for a moment did it take its eyes off me.

Knowing that it could be easily tamed and would make an amusing pet, I set about capturing my cat-bear. We played a jolly game. I pretended to climb the trunk, and as I swarmed up the cat-bear retreated along the main branch which overhung the slope, and made as if to come down; but as soon as I slid down, very leisurely, he climbed up among the foliage again. At last I laid

hold of the slender trunk and began to shake the crown. The cat-bear retreated backwards farther and farther, and the thin branches rocked and swayed under its modest weight. I threw a faggot at the little animal, but it only eyed me reprovingly. It was driven into an impossible position, though, now, and could not scramble back: no longer would the bent branches give purchase to its claws. After a short struggle it stopped trying, and hung there swaying, not in the least embarrassed, still staring at me with its calculating eyes. The lethargy with which the pretty little creature moved struck me as curious — as also the fact that it made no sound. Sometimes it hung vertically, head downwards, sometimes in a more upright position. I was wondering how to make it relinquish its hold and trying once more to scale the trunk, when, without warning, the animal let go and dropped a dozen or fifteen feet to the ground. So long as I stood guard by the trunk this was its only possible line of escape; and yet the manœuvre took me by surprise. Moreover, I was at a disadvantage, because I was a few feet away, and it was impossible to move quickly. With sorrow I saw the cat-bear, obviously not at home on the ground, though more agile than myself on ground so steep and rough, shamble rapidly down the slope and disappear in the forest.

There were signs that the natives had fired the forest, even so high as 9000 feet, though with what object it was hard to say. Probably hunters were responsible: obviously there could be no cultivation here. Derelict trees, charred to cinders, stood on the gaunt cliffs in attitudes of despair, and seedling trees, chiefly pines, hemlock, larch, and birch, were coming up everywhere to replace them.

On May 22nd two Tibetan strangers arrived from the other side of the mountains. They were on their way to Tahawndam. They said they had crossed the pass on the previous day, though I had not expected any communication with Tibet before the middle of June. The upper valley was still full of snow.

Cranbrook and I, seeing men cross the snow-bound pass in May, grew more and more restless. We decided we must go up to the alpine region at once, and be ready to cross the pass early in July. We sent a request by the newcomers to the village for coolies; but day after day passed, and none came. Another fortnight went by before we moved.

Of the travellers, who came from a village called Jité, one claimed to be the brother of our headman, Tsering. Ba Kai bought two pods of musk from him for twenty rupees, but I doubt whether he made any money on the transaction. The musk business fluctuates violently, boom following slump. In Calcutta the price varies from ten rupees to fifty rupees an ounce.

Several times I turned my attention to the cliffs on either side of the river. There was this great advantage that if one could climb them at all it was possible to reach an altitude of 10,000 or 11,000 feet in a few hours; whereas, following the river, it took half a day to reach even 9000 feet.

The forest zone directly above us, between 8000 and 10,000 feet, had as dominant rhododendrons *R. arizelum*, the cerise-crimson-flowered *R. cerasiflorum*, and the silvery leafed *R. niphargum*, whose small flowers, white, or faintly pink, with a purple flash at the base, were almost over. Here and there on the cliffs one saw the jaundiced *R. triflorum*, a dowdy shrub, and the more robust, metallic-yellow *R. aureum*; and in the moss forest at 10,000 feet grew *R. megeratum*, whose pale circular flowers do not last long. On the cliffs were *Pyrus Harroviana*, and *Magnolia globosa*, with last year's fruits still hanging on it. Higher up grew gnarled trees of *Viburnum Wardii*, with deep-green, wrinkled leaves, and a froth of chalk-white flowers, the pretty *Gamblea ciliata*, *Enkianthus*, and the common conifers.

It proved more practicable to walk up the valley than to climb the cliffs, and one day I went as far as the confluence of the next big tributary, at 9000 feet. Above that the gradient of the river-bed increased rapidly. From this point onwards the rhododendrons along the river-bank outnumbered all other trees and shrubs together. It was at 9000 feet that *R. bullatum*, the tawny-leafed *R. crinigerum*, and *R. selense* first appeared; above 9000 feet *R. selense* out-numbered every other species. Here also I saw *R. timeteum* in full bloom — the bell-shaped corolla self-coloured, a delicate shade of purplish rose. The flowers hang loosely in trusses of five, and are so numerous that the colour is a single mass. The fresh sea-green foliage, already fully developed, contrasted bravely with the amethyst cloud which enveloped the tree. It was often mixed with *R. arizelum*, and on the cliff across the river I could pick out through my field-glass the purple of *R. timeteum* amongst the breaking yellow seas of *R. arizelum*. Down in the forest were two shrubs which did not crave the light as urgently as do most rhododendrons; these were the scarlet-flowered *R. neriiflorum*, and a related species with flowers apparently orange — a colour effect produced by panels of old-gold on a red ground. Nothing would make these two small shrubs venture out into the open; they preferred the fetid gloom of the forest to the clean sweet air of the cliffs.

Sitting outside our tents one evening, Cranbrook pointed to a cliff across the river. Near the top was a grassy patch, and on this a foxy-red goral grazed. For a time we watched it through the glass. It must have been 300 yards away and several hundred feet above the river. Cranbrook got out his rifle and, taking careful aim, dropped the goral with his first shot. We saw it tumble over the cliff, but though we searched the forest below, next day, we could find no trace of it.

I wanted to be sure of getting seed of *Primula sino-Listeri* when its time came, so I went down the valley to where a patch of it grew on a steep earth bank. The flowers were over. I dug up a dozen plants, carried them back to camp, and planted them on a boulder. They ripened their seed, which in due course I collected. Plants raised in England flower every year in a Sussex garden and seem quite happy.

On May 27th two men arrived from Tahawndam. I thought they were the advance guard of our coolies, but they proved to be on their way to Tibet to sell skins. They had nothing for us; they said coolies were coming to take us to Jité, but they did not know when. The next day there came two more men, this time sent by Tsering, bringing peas and onions. They had orders to stay and

cut firewood and carry messages for us, but we heard no more of coolies to take us on our way.

To celebrate the last day of May I went for a big climb, determined if possible to reach the open ridge above the forest; I had seen it from across the river and reckoned it to be 4000 feet above our camp. Starting after breakfast, I found a way up the escarpment. Presently I came to a solitary tree of *Rhododendron Genestierianum* in bloom, and then at 9000 feet altitude I entered the zone of big-leafed tree-rhododendrons, first *R. sino-grande*, then almost pure *R. arizelum*, with scattered trees of *R. niphargum*.

Gradually silver fir increased, until it dominated the forest. At 10,000 feet *R. timeteum* coloured the cliffs theatrically, and *R. crinigerum*, mostly white-flowered, but sometimes pink, was also common.

On the open ridge, between 10,000 and 11,000 feet, I halted. Beyond this point, treeless cliffs broke through seething masses of *R. arizelum*. The sun beat down fiercely; sweat poured from me. My thermos flask grew too hot to hold. A slab of chocolate melted and ran like treacle. The ridge where I sat down to rest was clothed with a dense scrub of white-flowered andromeda with bronze foliage, with *Vaccinium*, and with rhododendrons. A thick growth of *Arundinaria* clothed the rockiest slope. There were no trees. On the way down I got trapped on the escarpment, the face of which had 'set-backs' like the New York Telephone Building.

There are four tiers of vegetation in the cool, temperate forest. First the conifers, hemlock, *Picea*, and *Pinus excelsa* tower above all other trees. The next tier consists of big broad-leafed trees, such as maples, oaks and birch, *Prunus acuminata*, species of *Ilex*, and *Magnolia globosa*. In the third tier are small trees and large shrubs, such as *Pyrus*, *Sorbus*, *Salix*, *Enkianthus campanulatus*, and yet other rhododendrons. Underneath there grow only dwarf shrubs, species of *Cotoneaster*, *Berberis*, *Euonymous*, *Ribes*, *Deutzia*, *Lonicera*, *Sporea*, and *Philadelphus*. The bigger trees are comparatively far apart, perhaps twenty or thirty yards on the average, the intervening space being filled in with smaller trees, shrubs and thickets of *Arundinaria*. Climbing plants, though fairly numerous, are not conspicuous, except occasionally in the autumn, when the leaves of the vines turn scarlet. The commonest climbers, after vines, are clematis, schizandra, smilax, *Aristolochia Griffithii* and schizophragma; but their complete absence would make little difference to the forest. The same is true of the epiphytes, consisting chiefly of ferns, and a few rhododendrons, most of which would grow as happily on boulders as on trees. Almost any rhododendron will start life in the mossy bole of a big tree, but few can continue there, for they soon grow too big for the lodging.

The river from the east, up which our route lay, was rather different from the northern river. I formed the impression that the northern was the bigger and therefore the source of the Adung. But anyhow they were different. The eastern river was clear, the northern milky. It rose amongst glaciers. Towards the source of the north river there is a nucleus of high peaks, three of them over 19,000 feet, all within five miles of one another. The highest is 19,315 feet. It will doubtless be news to

many people that there are snow mountains in Burma.

The path up this north valley soon came to an end and I could get no farther through the dense undergrowth to which fallen trees added confusion. We occasionally found paths made by serow or other animals through the forest, but such paths rarely take the direction that a human being is likely to require.

We had evolved two excellent dishes of late. The first was chop suey composed of peas, onions, potatoes, bamboo shoots and red fungus, which we found growing on old fir trees. We could vary this by adding curry powder and calling the result curry. The fungus and the bamboo shoots were a great asset.

The second dish consisted of fried bacon, onions, potatoes and fungus, on a rice basis, and was very heartening. With pemmican soup and a savoury, we felt we had dined well. One night, after an extra hard day's work, we treated ourselves to tinned Christmas pudding, and on the first day of the Chelsea Flower Show we celebrated that great social fête with a half-bottle of champagne.

Our hut was not a success. Though big and substantial it was less wind- and water-proof than the base-camp hut. Only the framework was solid timber. The walls were fake — just bamboo foliage; and the roof, though reinforced with rhododendron leaves, was not much better. The contractors had swindled us. The floor was bare earth; and a vestal fire, burning in the middle, had gnawed a huge cavity in the vegetable mould. It was only a temporary residence, though. We could not trouble ourselves with decoration and repairs.

Every opening in the forest swarmed with insects, especially 'daddy long-legs', butterflies, hoverflies and beetles, some of which I caught. 'Shrimping' among the dwarf bamboo with a butterfly-net was a favourite pastime and a prolific source of specimens. One day Cranbrook brought back a magnificent plant of *Nomocharis pardanthina* which he found growing by the river. It stood four feet high and bore nine flowers of a wonderful pink colour, spotted with purple. Later he showed me the plant growing on a grassy patch in the river-bed at 8000 feet. *Nomocharis pardanthina* is not a true alpine; that is to say, it does not grow above the tree-line; and I have rarely seen it growing above 10,000 feet. In the Adung valley it was fairly abundant on one scree of about that altitude. The amount of spotting varies in different flowers, possibly in different localities, and so also does the shade of ground-colour.

Our alpine camp at Lung Sa ('the flat place') was ready for us, but still Tsering showed no sign of activity. I was feeling quite desperate when, on the morning of June 5th, he and ten coolies arrived and bestowed themselves in a little cave just above the confluence. So I spent the day packing. With only ten coolies we could not both go up to Lung Sa; but Cranbrook and Mano, as before, agreed to stay behind till more coolies came. I had to hurry: I did not want to miss the alpine rhododendrons.

CHAPTER XVII

THE EAST HANGING VALLEY

I REVIEWED our position. Undoubtedly there was a pass at the head of the Adung valley. It did not lead directly on to the Tibetan plateau, neither did it cross any main divide into another river system, but it did lead to the head waters of the Taron. The Taron rises within Tibetan territory and is the main source of the Irrawaddy. As I have already remarked, the Tibetans of Tahawndam do not graze their herds near the pass, which made communication with the village difficult. But we were to find unmistakable signs that cattle had formerly been kept at Lung Sa, and there were Tibetan villages just over the pass. We must try to get into touch with them and to establish good relations. If Tsering and his slaves would not take us there perhaps the people on the other side would come over and fetch us.

Though we had coffee at six o'clock in the morning it was nearly eleven before we got under way. Cranbrook decided to accompany me on the first day's march and look for goral on the way back. June 6th was a beautiful sunny day, and the forest seemed enchanted. Fresh green undergrowth was springing up, and though the ground was not carpeted with flowers, little white frills of blossom on orchids, *Smilacina* and *Pyrola rotundifolia* laced the banks. This was very different from the heavy undergrowth of Base Camp. An unfamiliar-looking woodland iris grew in a shady ravine, but it was not in bloom. On my way down five months later I found two or three capsules of ripe seed. It had flowered during the rains.

In less than three hours we reached the confluence, at 9000 feet altitude, and halted for lunch. Owing partly to the heat we were very tired and decided to rally ourselves with a bottle of 'simpkin' (the native pronunciation of the word 'champagne'), the chief of our medical comforts. We had the surprise of our lives when we cut the wire and immediately the cork blew six feet into the air with a loud pop, followed by a fizzing fountain of wine — though enough remained to comfort us. This was due to the lower atmospheric pressure at this altitude. And it was not the only effect. Our non-vintage champagne tasted like Heidsieck '21 and procured us for a couple of hours a truly sublime elation. The golden stuff seemed to volatilize as we sipped it, until we ourselves felt as light as the air. The mood passed, though. The champagne did not help us on the last thousand feet of the climb. The valley grew steeper. The river made a terrible clamour; it dropped 1000 feet in a mile and 2000 feet in just over two miles. Tufts of forest clung like moulting fur to the cliffs. Gullies choked with snow slit the mountains on each side, and rock avalanches had ploughed across the meadow. A thin cascade falling over a precipice looked like a stretched silver wire. Near by, the river cut through a deep snowdrift.

The trees were now such as one meets with in northern countries. Birch and maple mingled with silver fir, larch and spruce. Thickets of rhododendron were jumbled up

with boulders, and an impenetrable brake of dwarf bamboo (*Arundinaria*). Conspicuous along the river bank was a rare shrub with long drooping racemes, unfortunately only in bud, and large soft leaves. At first sight one would take it for a species of Clethra, but actually it is a closely allied genus called *Craibiodendron.* I never saw it in flower, but in October I collected seed of it. In one stony gully grew scores of *Nomocharis*, but the flowers were not yet open.

At 10,000 feet altitude we entered rhododendron forest (*R. arizelum*) and pitched our tents on the springy moss mattress beneath the foliage canopy. The sun had disappeared, and a fine drizzle of rain was falling; the air felt cold and thin.

On the following day Cranbrook started back for Camp One, carrying his rifle and rucksack, and we did not meet again for nearly a fortnight. So long as he remained at Camp One, on the line of communication, he was able to keep in touch with the village and with me. From time to time Tsering sent up coolies with a few supplies — chickens, eggs, onions and a little *tsamba;* and Cranbrook sent a generous ration on to me with every stores box and bag of rice which came up. It took some time to move all the loads from Camp One to Lung Sa. After Cranbrook had joined me, we were virtually cut off from Tahawndam for four months.

My last march to Lung Sa, on June 7th, was long and tiring. We took seven hours to ascend 2000 feet in five miles. The path through the fir forest was rough, and crossing the torrents took a considerable time. The forest dwindled, then became intermittent. Meadow, pocked with deep pools of peaty brown water, invaded the valley. Dwarf intricate rhododendron spread a film of vivid colour over the scattered rocks. The mouths of hanging alpine valleys, aloft and concealed, spouted water through pursed lips; on every side one heard the thin tinkle of cascades. A tough scrub barely hid vast boulder-dams, raised like barrows to the memory of vanished glaciers. In the remnant of fir-forest were a few tree-rhododendrons, but no shrubs. These stayed in the open. *R. Beesianum* was still of tree size, its large hemispherical trusses of small white flowers blackened with plum juice at the base, thrown into sharp relief by the fifteen-inch leaves. Occasionally the flowers were flushed rose. But already it was past its best. *R. Beesianum* goes higher than any other tree-rhododendron found in the Adung valley.

The most prolific of the species were massed along either bank of the torrent. Here the rose-agate of *R. selense*, flecked with the dark amethyst of *R. timeteum*, shone brightly against the effervescent river. In the afternoon we reached a belt of forest, under the lip of a hanging valley, and discovered three men putting a roof on our log hut, which had long since been reported finished. It stood on the river bank, hidden by willows. Immediately beyond was a wide meadow, boggy in places, across which several streams flowed to the river. Scattered over it were little bushes of a small-leafed rhododendron and many flowers. On either side of the valley, cliffs and screes rose to the clouds, and there was much snow. Such was Lung Sa.

My plan was to spend a month here, exploring every

glen and cliff, and then try to cross the range and see what lay beyond it. We could not be far from the pass which men had crossed recently, and if they could cross it so could we. The next day the coolies finished the hut, and having thrown a log bridge across the river, they departed, leaving Ba Kai and myself alone.

The monsoon was now ushered in with a creeping barrage of cloud which swept steadily up the valley. Commonly the mountains were hidden in mist. Sometimes scuds of rain swooped on us out of an open sky. The main valley below Lung Sa was resplendent with summer flowers, but one could have gone ski-ing in any of the hanging valleys.

I took a rapid look round to form some idea of the local geography and its horticultural possibilities. Our camp was situated, as I have said, in the alpine region at an altitude of 12,051 feet. In sheltered spots a few stunted fir trees still survived, but this was exceptional. There was no continuous forest; trees had given place to dense scrub, as impenetrable as any jungle. Then there was the aqueous meadow where a succession of alpine plants flowered. More alluring, if less accessible, were the hanging valleys which opened high up into the main valley on either side, and the tall tapering screes between. The gaunt granite cliffs were bare. Nearly all the plants I saw occurred in vast numbers. A few, comparatively uncommon here, would be common in the next valley. The difficulty was to discover a rare plant.

I began by exploring the valley which opened immediately above our camp. I called it the East Hanging Valley. It was invisible from below until one had ascended nearly a thousand feet by a rough track which climbed up beside the waterfall. At the top, one entered a short, wide valley, where the stream flowed more gently. On the sheltered side was a strip of meadow, backed by cliff submerged beneath pink-crested waves of rhododendron; on the south side, scree-cones a thousand feet high rose straight from the stream. Half a mile farther on, this pleasant alpine valley suddenly ended in a flat-bottomed bowl; all beyond this, from 13,000 feet upwards, was snow. The bowl was floored with sand and turf, over which boulders lay scattered. The stream meandered through it in a deep channel, and other streams joined in, flowing from beneath piles of boulders. The East Hanging Valley became a popular mountain resort with me. I could get up there in less than an hour. Though barely three miles long (its apex was blocked by a permanent snow bed), it offered every variety of situation to alpine plants. There were cliffs — but these were bare — and screes and boulder-dams; there were meadows, sand-banks and turf slopes; there was even a favoured hollow where fir trees grew, and all this in about 2000 feet of altitude. I calculated that there were five hundred species of flowering plants, belonging to seventy-five genera, in this tiny valley. The rhododendrons alone included twenty-five different species.

Considering that the East Hanging Valley was under snow for six months out of the twelve it was surprising to find the dead capsules of last year's flowers still with seed. Capsules of *Primula muscarioides*, iris, *Nomocharis nana*, and even *Omphalogramma* all contained seed. The *Nomocharis* seeds were germinating in the capsule, pushing out their

tiny rootlets. Freezing, far from having harmed them, had evidently braced them. Surprising too was the sight of the large, barrel-shaped, pillar-box-scarlet berries still intact on a leafless *Cotoneaster*; everything seemed to be the wrong way round here. I thought at first the *Cotoneaster* berries must be bird-proof, until I saw birds eating them, eating also the rather decayed looking white berries of a rowan. By the time these alpine fruits are ripe at the end of October, however, almost all birds have withdrawn to the lower valley. It is not till the following May, when the first migrants arrive in the alps, that there are any birds to eat berries.

While in the East Hanging Valley, I heard the musical call of the yellow-throated grosbeak (*Perissospiza icteroides*), an unmistakable bell-like note. These birds were going about in pairs, nesting; there was always a pair in the patch of fir-forest here, but I never succeeded in shooting a specimen. This grosbeak is a spectacular bird, as big as a good thrush, with a black head, back and wings, brilliant gamboge throat and breast and a purple beak. Though not abundant, we saw, or more frequently heard, grosbeaks throughout May and June. On my next visit to the East Hanging Valley, about June 13th, I watched a sunbird visiting the crimson flowers of *Rhododendron chaetomallum*. He was a bold bird; I stood within a few feet of the bush while the little fellow, brilliant in scarlet and orange, with violet throat and ultramarine cap, danced to and fro, flickering his wings continuously, even when he settled, as though to shake off the rain drops. His wife was dressed in dark green with a pale green breast. The corollas of *R. chaetomallum* contained small flies, and the sunbirds were probably attracted by these; but they could hardly have failed to move pollen from flower to flower.

A laughing thrush with a speckled breast, and his plainer mate, were sliding in and out through the bushes in quest of rowan berries. From time to time these birds would hop up to the top of the tree, and peck at the rotten fruits — never flying if they could help it. I shot a pair for the pot, but there is very little meat on them, and even that is tasteless.

A good many birds came round my hut in the early mornings, and here I shot a female laughing thrush. Afterwards I wished remorsefully that I had not; for her disconsolate mate haunted me. He hung round the hut, uttering his mournful love-call, four notes repeated over and over again, until I could hardly bear it. Then he would give a despairing sort of wheezy wail and vanish like a banshee. Next morning he returned and sang again.

Having collected some *Cotoneaster* seeds I spread them out in the hut to dry. During the night a mouse ate not only the *Cotoneaster* seeds, but several others also. So I set traps round about, but only caught voles.

We had not been a week at Lung Sa when visitors arrived. 'George' and the lama from Tahawndam, *en route* to Tibet to buy salt. The same day five coolies arrived with loads of stores from Camp One, bringing also a note from Cranbrook. After that we had no further communication with Camp One for a week. But on the 17th I returned to camp, after a climb, to find another eight loads arrived and a cheerful note from Cranbrook.

Shortly after my arrival at Lung Sa I walked up the valley to a point beyond the last outcrop of forest. I hoped to see the pass. Crossing the meadow I picked up a track through the belt of trees and found tangles of dwarf *Viburnum cordata* with rich green rugose leaves and chalk-white flowers, along the open muddy places. But the finest sight here was *Rhododendron selense* with flowers of old rose, ivory and flushed salmon. It was in full bloom, and no two bushes were the same shade. The forest extended a very short distance, and emerging from cover I could see right up to the head of the valley. Snow lay deep over everything, but there was no mistaking a small glacier at the extreme head of the valley: it flowed from a rocky peak named Dindaw Razi, about 18,000 feet high. And there was no sign of a pass. I was puzzled. Men had certainly gone up the valley; men had certainly come down the valley. How had they made their way *out* of the valley? Clearly I must go and see. I returned to camp, still puzzled.

As I have already mentioned, woody plants did not end with the forest; there was the scrub belt. Nor did this consist only of rhododendrons. Willows were conspicuous, many of them in bloom. There were big shrubs a dozen feet high, and tiny prostrate mats less than an inch high. Some of the carpet willows bristled with flowering spikes. I longed to see them spreading over my rock garden at home, their thin, polished, amber-yellow and mahogany-red stems, shining leaves and silky plumes very elegant. There were six or eight species, but no two kinds grew together, though one species would often cover many square yards of rubble scree. Mixed with the scrub rhododendron were juniper and *Cotoneaster*, *Viburnum*, *Berberis*, *Lonicera*, rowan and other shrubs. Birch and a much-stunted maple, with broad pentagonal leaves, grew on a boulder-dam by themselves.

By the middle of June the drizzle which heralded the monsoon had turned to good honest rain; but rain fell more by night than by day — as I had reason to know, because the roof of the hut leaked. Whenever coolies came up from the lower camp I put a working party on repairing it, and by the time Cranbrook arrived it was more or less watertight. The creeping cloud sometimes missed our valley, too, and more than once the sun shone brilliantly in the early morning after a night's rain. One sparkling dawn in the latter half of June, I awoke to see the slopes just above Lung Sa powdered with fresh snow. It was tantalizing to look up the valley and see the turreted ranges, clear-cut against the turquoise sky, and to feel that over the mountains, perhaps no more than a long day's journey distant, was the promised land of Tibet.

Birds continued to call, but I always heard the same voices, especially the grosbeak. On June 17th I started up the valley after breakfast, but had not gone far when I met Tsering. I did not even know he had gone to Tibet. We walked back to camp together, and I tried to impress on him the necessity of getting me coolies. He promised an unlimited supply in a week. He brought me a lump of butter, some *tsamba* and a few small onions, which, fried with a slice of bacon, made a good breakfast dish.

Baulked of my trip up the valley, I spent the afternoon in the meadow. For several days I had kept my eye on some dwarf rhododendron bushes with little crisp leaves

[*facing:* LOOKING UP THE VALLEY TOWARDS NAMNI LA FROM LUNG SA CAMP and twiggy shoots covered with fat buds, which showed sulphur-yellow between the loosened scales. The open flowers now proclaimed that this was, as I suspected, *R. chryseum*, one of the most charming of dwarf species. Then hidden in a far corner of the meadow I found another nursery, and here the colours of the flowers showed an astonishing range of pastel shades, salmon, apricot, raspberry-and-cream, strawberry-and-cream, with darker tones of terra-cotta and mahogany and burnt sienna.

Two days later the meadow produced another surprise, a dwarf rhododendron, exactly like *R. chryseum*, but with *plum-purple* flowers. In all other respects they were identical. That the pastel shades were the result of a natural cross between the yellow-flowered form and the purple-flowered form was obvious. The ordinary yellow *R. chryseum* was common in the valley up to 14,000 feet altitude; but the purple-flowered form was very rare, and the colour mixture occurred nowhere else. I pictured to myself an English rock garden covered with two-foot brooms breaking into a dizzy foam of coloured crests in May; and I tied red wool round all the best colour-forms, because when the flowers were over all the bushes would look alike.

Two other dwarf rhododendrons which grew on the rocks near our camp were *R. riparium*, with large, rosy-purple flowers darkening to purplish magenta, and *R. crebreflorum*, with pale pink or white flowers, so tightly clenched as to look like one large dimpled bloom. The former grows two feet high and has a powerfully exotic appearance, due to the size of the flowers and their lurid colour. They are not at all like the conventional rhododendron bell, but are flattened pentagons, about two inches in diameter, borne erect on stiff pedicels, two or three together, back to back. A heath-like shrub, covered all over with such brilliant flowers hoisted well above the little sea-green leaves, is most attractive; and there were acres of rocky slope covered with *R. riparium* here.

R. crebreflorum is no more like the popular idea of a rhododendron than is *R. riparium*; but the two are quite unlike each other. If you closely examine *R. crebreflorum* you find from six to twelve flowers in a head, and the pedicels are so short that the flowers are all crushed together. The corolla is neither bell-shaped nor flattened, but consists of a narrow, curved tube, expanding at the top into a sort of salver. Seen growing side by side these two make a strange contrast.

I returned to camp early on June 19th, and found Cranbrook just arrived. He had shot a blood pheasant and seemed very pleased with himself.

CHAPTER XVIII

MANO GOES DOWN WITH FEVER

The arrival of Cranbrook at Lung Sa did not coincide with the complete evacuation of Camp One, for Mano was still there. Cranbrook had wisely left him behind to guard a few remaining sacks of rice for which transport was not yet available. Neither Tibetans nor Darus practise theft for its own sake, and our personal property was safe. But a hungry man might find a sack of rice too great a temptation, and, though he might offer to pay for what he took, money cannot help you in the Adung valley when you want food. Rice which has to be fetched from Fort Herz has a quite unreckonable value here.

Our hut was divided into two rooms by a partition, and to secure greater privacy each room had a separate entrance, mine looking up the valley and Cranbrook's down it. Thus, if either of us wanted to stand in his doorway and admire the view, he need not be incensed by his neighbour's alien ecstasies. We took these precautions to avoid too close contact with each other, well knowing how difficult it is for two men to live together in harmony for months on end. The lonely life is not conducive to tolerance. One is set in one's own ways and apt to regard the other man's ways as a perpetual insult. Irritability grows by what it feeds on. All sense of proportion is lost, and every little incident is magnified. Habits become crimes; mannerisms become vices. But actually, though I was wise to put as little strain as possible on our friendship, I should have found it hard even in my intransigent early morning mood to quarrel with Cranbrook. Nothing ruffled him. He had the sweetest temper imaginable, and even when he was thoroughly ill he never complained.

We each had a fire. Over mine was suspended a large rack on which paper for pressing plants was spread out to dry. We ate our meals in my room. It was a pleasant experience to get back to Camp at four o'clock, wet through and tired, to find a big fire blazing in the corner and clothes warming in the wood smoke. Then with numb fingers, assisted by Mano when he arrived, I would strip off my clothes, dry myself with a towel and put on dry garments sticky with smoke, while Ba Kai was preparing our tea. Presently Cranbrook would come in, and we would sit down to a leisurely meal of hot chupatties, tea, and biscuits while we recounted the day's adventures. After tea Cranbrook would devote himself until dinner time to his birds and rats and I to my plants.

Sometimes we went out together. But more often my search for plants took me farther afield then Cranbrook's bird-hunting required.

In order to give a more adequate idea of the alpine flora I will describe the various kinds of plant-associations which we found between 12,000 and 15,000 feet altitude. The association varied with the type of scenery, with the exposure and, in a lesser degree, with the altitude and nature of the soil.

I have already referred to the open marsh, through which flowed the main stream, at this season still too big to ford. Conflict, silent, prolonged and deadly, raged in the marsh between meadow and scrub, between grassland and the many flowers of the grassland, and thickets of willow and dwarf rhododendron. What controlled the fight or decided the issue it was difficult to say. Where the ground was most waterlogged and the water more or less stagnant, meadow prevailed.

Dozens of delightful flowers grew in the marsh; I was endlessly finding new ones. Tall golden *Trollius*, a dwarf carpet geranium (*G. Doonianum*) with large purple blooms whose leaves turned scarlet in the autumn, stately rattles (*Pedicularis*) with crimson or yellow flowers, violet iris and dwarf aster — all these were seen in June. Then came more and taller asters, and the meadow was crimson and yellow in places with *Pedicularis*, and elsewhere porcelain blue with tiny bright-eyed *Gentianella*, and again Prussian blue with the countless berries of a creeping *Gaultheria*. In late summer the big violet flowers of *Cyananthus lobatus Wardii* began to open, and the plant grew fiercely, putting out its octopus tentacles in every direction. At this time, also, many small orchids with tiny but exquisite flowers were scattered through the wettest part of the bog. Finally in autumn came the lovely blue *Gentiana Veitchiorum*. These are but a tithe of the hundred species of plants which made the marsh so happy a hunting-ground.

Just across the Adung river a tall scree, like a split cone, leant against the mountain. It tapered for 2000 feet. The largest boulders lay round the base, and the material grew finer and finer as one ascended, until, near the summit, it was composed mainly of coarse sand. At the base of the scree grew thickets of *Rhododendron trichocladum*, *Spiraea* and *Lonicera*, all wreathed with snow-white *Clematis montana*. These shrubs dwindled in size and were replaced by encrustations of *Cotoneaster microphylla*, which spread coral-like over the rocks.

As the scree material grew finer, the flora changed to a close carpet of *Gaultheria* and *Cassiope*, affording cover for many ground orchids, the claret-red *Nomocharis Souliei* and a charming pink-flowered variety of *N. nana* — the last-named a rare plant. One might have overlooked the *Gaultheria* in flower, but in fruit it was startling, for the steep gravel slide seemed covered with thousands of glistening white hailstones, sometimes flushed pink; they almost concealed the tiny leaves. Towards the top of the scree, where the soil was sandy, large mats of *Cyananthus* were already conspicuous, though it would be two months before they flowered. Then came cliffs, whose constant breakages were responsible for the scree. They were covered with the bright yellow-flowered *Rhododendron chryseum* and the crimson *R. riparium.*

Above the cliffs, one stepped into an alpine valley, where it was possible to walk in fair comfort. Here a different selection of flowers dominated the scene. One grassy alp was covered with the flamboyant *Omphalogramma Souliei*, each enormous violet flower borne singly on its short stem like a hot-house orchid; yet it grows at 14,000 feet elevation, and for six months in the year it is under snow. Another corner was yellow with a scented *Cremanthodium*, whose shining leaves like new leather are extraordinarily fragrant. Here and there were colonies of minute primulas, notably the bright violet stars of *P. bella*, and the dangling claret bells of *P. Valentiniana.*

One day I climbed up a snow-choked gully on the sheltered side of the valley for 1500 feet. This brought me finally to the naked cliffs, where nothing grew. But the smooth gully was lined on both sides with impenetrable scrub consisting of *Rhododendron chaetomallum* (crimson flowers), *R. Beesianum* (white with purple blotch), *R. crinigerum* (pale pink speckled purple) and *R. riparium* (magenta), with *Pyrus foliolosa*, *Viburnum*, *Berberis*, willow, cherry, birch, and *Cotoneaster*. The gully itself, towards the summit, where the snow had melted, was paved with the yellow and purple *Diapensia himalaica.* So closely did this mat cling, rippling smoothly over every bump, that the colours might have been laid on with a coarse brush. Thick sponges of moss, warm and moist, filled the hollows and, through the sodden cushion, stiffened snakes of club-moss (*Lycopodium alpinum*) made their tortuous way. The mere weights of snow had kept even the incompressible dwarf rhododendrons, such as *R. repens* and *R. crebreflorum*, glued to the rock, quite flat: the one with large vivid-scarlet bell-flowers, the other with little heads of compressed pink flowers, like clotted foam. A butterwort (*Pinguicula alpina*) was scattered through the moss. But the most charming plant of all was the dwarf *Vaccinium modestum*, whose leafy stems, only an inch or two tall and growing in colonies, raise little waves of dark vinous foliage between the rocks. The large solitary flowers, like Chinese lanterns, are flushed with a warm rose glow and nod on wire springs. Big for the size of the plant, circular and flattened instead of being drawn out into tubes, they are unlike those of any other *Vaccinium*. In autumn they are followed by large, succulent, glaucous violet berries, pleasantly sub-acid in flavour.

I came down the gully much faster than I had gone up it, sliding in the snow. On the way down, I noticed several plants of the purple meadow lily, *Notholirion campanulatum*, just pushing through the soil.

Cranbrook, before he joined me, had rationed Mano for ten days. We expected him at Lung Sa in a week. However, at the end of ten days there was no Mano, so I sent Ba Kai down to him with food. Starting early, he managed to get back the same afternoon, bringing with him two coolies and two more loads from the lower camp. Mano was down with fever. But, at any rate, he had plenty of food, and two of his friends from Tahawndam were with him. He sent word that they would all three come up in a few days.

We expected to find plenty of game in this wild country, but in this we were disappointed. Cranbrook went out with gun or rifle every day and systematically explored the hanging valleys, but always without result. We were dependent on him for fresh meat; and every evening I looked forward to hearing that he had shot, or at least seen, something larger than the shrews or voles he took out of his traps. But the alpine valleys appeared to harbour nothing larger than pygmy hares, though once we saw a weasel. Evidently the larger animals were confined to the forest. However, there were game birds. Cranbrook shot a blood pheasant and a snow-pigeon. We also ate the small birds he shot, though most of them were smaller than an English thrush.

The valley kept us more adequately in green-grocery.

Wild garlic was common in the meadow. On the silver fir trees grew masses of the orange fungus already mentioned, and we collected a few bamboo shoots. Ba Kai did his best to give us a good miscellaneous curry every night for dinner. We had plenty of rice, but flour was running short, and it was going mouldy into the bargain. Our stores, carefully but not drastically rationed, were holding out well. We had plenty of tea, biscuits, jam, butter, chocolate, pemmican, milk, raisins, bemax, porridge and rum. Luxuries like Christmas pudding, tinned fish, sweets and champagne — medical comforts — were only for fête days or for when we felt really ill. Our weekly consignments of bacon and sausages reached us once in every two or three months and were finished long before the next consignment arrived. We lived well and always had enough to eat, though we could have eaten more; but we had to think of the winter. Our conversation often turned to food. We discussed what we would eat when we got back, where this restaurant was, what sort of meal you could get at that one, the advantages of Chinese as opposed to Spanish food served to the London gourmet. One thing which I missed was sugar. The jam, honey and treacle we got did not nearly satisfy my need for sugar, and I began to feel a craving akin to that of the drug addict for narcotics. As a result, I claimed my share of the 'fudge' a kind friend in Myitkyina posted to us from time to time, much to the disgust of Cranbrook, since at the beginning of our expedition I had turned up my nose at it. I never need sweets at home.

Cranbrook, though no botanist, always took the trouble to gather any striking-looking plant he saw, and it was he who found the first specimen of *Meconopsis horridula* in the West Hanging Valley, a form with pale-blue flowers. It was uncommon in this country. He also discovered a colony of the big-leafed, violet-flowered *Primula chamaethauma*, on a grassy alpine slope. It is a magnificent plant which I had discovered in the Seinghku valley in 1926. Not growing below 14,000 feet and found only on these snow-bound ranges, *Primula chamaethauma*, which is allied to *P. Winteri*, a cultivated plant, will not take kindly to the English climate.

Every morning, as soon as it grew light, we heard birds singing lustily. The grosbeak was one of the most constant singers, and it had the peculiarity of always sounding farther away than it really was. A small greenish finch, the first to twitter in the morning and the last to stop at night, was so tame that it followed us about. Couples of the white-eyed laughing thrush appeared everywhere up to the last patch of forest, and the fire-tailed sunbird was not rare even above the tree-line. I was fortunate enough to find a nest of this last bird, firmly fixed in a rhododendron bush which grew on a cliff beside a waterfall. The nest was egg-shaped, like a long-tailed tit's, with the round entrance in one side near the top, and it was made of moss lined with grass. The glen was dark and horribly wet and covered with the usual impenetrable rhododendron scrub; but the nest was just out of the splash of the fall, deep, dry and snug; it contained three half-fledged babies.

One bird, which I heard several times but failed to see, made a noise like a grasshopper; it may have been

a bush warbler, or a willow warbler, both of which Cranbrook shot. The Indian rose finch was not rare; a native had shot a rose finch with a cross-bow in May, but whether it was the same species or not is uncertain. Meanwhile Cranbrook collected and skinned specimens daily. Several of them he shot above the tree-line, where there was plenty of insect life, especially in the thick covering of dwarf rhododendron. There were also last year's berries. Amongst his specimens were the mournful Oustalet's laughing thrush (the white-eyed bird *Trochalopterum affine*), the Tibetan tree-creeper (*Certhia familiaris*), a first record for Burma; golden bush-robin (*Tarsiger chrysaeus*), yellow-bellied fly-catcher (*Siphia strophiata*), spotted bush-warbler (*Tribura thoracica*) and Nepal orange-barred willow-warbler (*Phylloscopus pulcher*) — both common — with Beavan's bullfinch (*Pyrrhula erythaca*), and Hodgson's pipit (*Anthus roseatus*).

Most of the birds collected here were only seen at Lung Sa or higher, though all of them must have come up by stages. Oustalet's laughing thrush was the only species of which we obtained specimens both at Base Camp and at Lung Sa. This bird is omnivorous in its diet, but seems to prefer seeds to insects. There appear to be two kinds of migratory birds in these mountains: the migrant from afar, coming north from the plains, and a vertical, short-range migrant which drops down into the warm valleys when the snow comes. The great majority of Himalayan and Sino-Himalayan birds probably belong to the latter group. There is probably no winter-resident bird-population in the high alps of Assam and Burma, between the gorge of the Tsangpo and that of the Yangtze, where the snow for six months is deep enough above 12,000 feet to cover every living plant.

On my climbs for plants I noticed many strange birds. But, since I did not carry a gun, I had to content myself with reporting them to Cranbrook.

Insect life was abundant and increased as the summer wore on, but luckily for us it was not aggressive. It was too cold for mosquitoes, and even sandflies, which had been such a terrible pest in the Assam alps, were blissfully absent. I could well imagine Base Camp to be a torture chamber of horrors, from leeches and ticks to centipedes and venomous snakes; but in our rarified atmosphere we were quit of them all.

June 19th and 20th were fine, sunny days. On the latter date I climbed one of the many waterfall cliffs into the hanging valley above and found it filled with snow. It was pleasant to sit in the sun and eat one's lunch on a boulder starred with carmine cushions of *Daipensia*, surrounded by a glittering snowfield. At the foot of the cliff the claret-red *Nomocharis Soulei* grew in the meadow. Though only six or eight inches high, with one or occasionally two flowers on the leafy stem, this dwarf lily is by no means insignificant. The large size of the flowers and their unusual colour attract notice. There were also some very charming little plants on the granite cliff itself, including the aforementioned *Vaccinium modestum* and a pygmy pink-flowered Sorbus with glistening, jet-black branches. The flowers of this last are succeeded by moon-white berries. Tussocks of dwarf rhododendron mixed with *Cassiope* huddled into the hollows between the rocks; and then would come a barer ledge, yellow with primulas.

Ascending the Adung valley, I noticed rhododendrons in bloom, at higher levels, which a month ago were finished at the lower camp; at still higher levels they were only in bud. For example *R. selense*. It was sometimes difficult to decide whether the high-level plant was only a dwarf form or a distinct species. The pygmy Sorbus just described might be a sort of arctic form of *S. foliolosa* or something new, and the same with *Pieris ovalifolia*. There is even a dwarf alpine form of *Rhododendron crinigerum* found at over 12,000 feet. Several shrubs had a vertical range of 5000 feet, and although in these latitudes there may not be much difference between sea-level and 5000 feet, there is a vast difference between 10,000 feet and 15,000 feet. The rate of change of vegetation increases with increased altitude.

When the sun shone, hundreds of butterflies made their appearance. They were all of one species, a creamy white, and poor fliers. Butterflies must have rather a dull time during the rainy season; but they are always there, ready to come out when the rain ceases. Jumping spiders were numerous, and a curious little spider made its home inside the empty capsules of iris and *Nomocharis*. Cranbrook made a collection of spiders, but most of them gelatinized. We had better luck with a 'daddy-long-legs', which occurred in great numbers and extraordinary diversity, varying from gigantic insects, with a wing span of six inches, to a queer alpine insect, found in the scrub rhododendron at 14,000 feet, one sex of which flies, while its mate, having only rudimentary wings, has to crawl.

We caught many of these *Tipulidae*, nearly all of which proved to be previously unknown. They came into the hut after dark, attracted by the light, especially on rainy nights, which suggested a certain wisdom. It must have been miserable flitting about in the Adung valley at night when the air was thick with fine mist, as it so often was.

That voles abounded in the alpine region was evident, but for a long time we failed to trap any of them with our elaborate spring traps. What made this so much more galling was that our Daru coolie, with his primitive bamboo spring trap made on the premises, easily snared them. Their runs were under the rhododendron bushes in alpine meadows; and, since they were clearly conspicuous in places where the snow had just melted, Cranbrook thought they must run about under the snow in winter. Unlike the birds, the alpine mammals spend the winter high up.

Both Cranbrook and Ba Kai were out of tobacco. This was too much for Ba Kai, who took to drying the leaves of plants — chiefly a species of aster — and smoking them. He reported favourably on the substitute, but Cranbrook found it easier to give up smoking.

On June 28th two unknown Tibetans arrived and seemed very surprised to see us. No doubt they had heard of our presence and came to see if there was any truth in the rumour. They went on down the valley to collect medicinal roots, leaving us a fid of butter.

On the last day of June I arrived back in camp at tea time to find Mano and two more loads from Camp One and, more unexpectedly, two coolies from Fort Hertz with a bulky mail. They had left Fort Hertz on June 5th and so had been over three weeks on the road. Our English mail was two months old but none the less welcome for that, and there were the tins of bacon and sausages from Rangoon. The arrival of a mail always broke into our placid routine with high explosive effect. This time it decided Cranbrook and myself to make our trip up to the head of the valley next day; and if possible discover the source of the Adung river and so of the Tamai. The last time I had been up the main valley, I had soon come to deep snow. But three weeks had made a difference. By June the warm air from below is rising continuously, and the snow is melting fast; the rivers in spate come roaring down the mountain scuppers, bringing with them a touch of mountain chilliness to temper the unbridled oppression of the jungle. Thus the Tamai river at Hpalalangdam in August, when the valley, only 4000 feet above sea-level, is like a Turkish bath, derives a measure of coolness from the presence of the river.

The path skirted a succession of high gravelly banks above the river. These were covered with spotted yellow saxifrages, dwarf primulas, anemones and stiff mats of prickly *Calophaca* (*Caragana*). Some of the mats, though not more than a foot in diameter, were at least a quarter of a century old, as we proved by counting the shrivelled remains of previous years' leaves away back to an earlier decade. Roots like ship's cables two yards long anchor the plant to its unstable mooring and keep it from drifting as the high bank slips and slides. For six months this *Calophaca* is buried beneath the snow; and it is when the snow is melting that the scree reshuffles itself before settling down, tearing at the foundations of the plants growing there. Many a plant is thrown out in these paroxysms, but those that can hold on take a firmer grip each year and flourish. *Calophaca* was certainly a remarkable plant. The black, snaky stems bristle with the successive tufts of previous years' leaves; they grow in length only a fraction of an inch yearly. The gorse-yellow peaflower boats, with all sail set, seem to ride the tiny dark-green feathery leaves, which curl like breaking waves round them. The pods are short and fat; they dry quickly and open with an explosive crackle in autumn, violently expelling the seeds.

We were soon tramping over carpets of dwarf rhododendrons, but, since they had only just been released from the snowy covering, they were not in flower. Here and there the lurid magenta of *R. riparium* glowered at us. Scattered about the moorland were flowers, including the purplish *Nomocharis nana* and the violet-flowered dwarf poppy, *Meconopsis impedita*. Clambering up the end of an ancient moraine, long since covered with vegetation, we found ourselves overlooking the head of the valley, which was dominated by a high, rocky peak. Our altitude was about 13,500 feet, and the mountain rose nearly 5000 feet above us. The valley was completely closed at its head by a small glacier which flowed round from a snowfield on the north face of the high peak. There was no way out there. On our right an earth cliff blocked the view of a hanging valley, south-east of the high peak; a rough path zigzagged up it for several hundred feet. Here at last was the exit from the Adung valley and the final ascent to the pass. We left the exploration of that for another day and returned to camp.

CHAPTER XIX

A BAND OF DESPERADOES

For a hundred days, from the beginning of July till early in October, it rained every day and often the whole day for days on end, in the Adung valley. If it hadn't rained so remorselessly there wouldn't have been so rich a flora, and in particular there would have been fewer rhododendrons, so on the whole I was well content. The four-mile radius from Lung Sa included the East and West Hanging Valleys, and the source of the Adung river; but the Namni pass hardly fell within municipal limits, and it required something of an effort to go there and back in the day.

Towards the end of July, when the alpine meadows were waterlogged and the atmosphere saturated, and nearly all the snow had gone, save from the deep cold-storage glens, a plant I had watched anxiously for weeks opened its lowest flowers. It was *Notholirion campanulatum*, once upon a time regarded as a true, if slightly bizarre, lily, under the name of *Lilium hyacinthinum*. The lilies, however, though north-temperate, are not alpine plants; and in the course of ages, on the great alpine chains of Asia, they have given origin to several lily-like, but distinct, genera, such as this *Notholirion* and *Nomocharis*. Most of these are strict alpines, but *Nomocharis pardanthina* is an exception.

From the midst of a few basal leaves, *Notholirion* *campanulatum* shoots up a tall, smooth, shining green stem which bears at intervals narrow leaves, sticking gawkily out; the stem ends in a spire of numerous, purple-red or amethyst, lily-like flowers. This *Notholirion* was far from common, and I found only three small colonies of it, between 13,000 and 14,000 feet. A patch of meadow might contain half a dozen scattered plants, not all of them of flowering age. The bulb lies deeply embedded in the glutinous black earth, and among its branching roots are entangled numbers of tiny bulbs, forming a vast reserve of progeny. But seeds also amply provide for the future of the race. This *Notholirion campanulatum* bears a dozen or more flowers, and each capsule produces several hundred seeds, so that one would expect the plant to be abundant. The fact that it is not proves it a newcomer to the plant world and a not altogether successful one. In cultivation it has, like *Nomocharis*, proved difficult, whereas most temperate Himalayan plants are comparatively easy — another indication that it is a sensitive newcomer.

Experience proves that most plants from the northern hemisphere which enjoy temperate conditions can be cultivated in Britain with little difficulty, all the more so if they are widely distributed. When we seek a reason, we find that these 'easy' plants, now widely distributed in space, are also deeply distributed in time; they have a vertical as well as a horizontal distribution. Many of them, though now extinct, once grew in Western Europe. Small wonder then that their descendants feel that Britain is not so strange to them. But *Notholirion*, *Nomocharis*, *Cremanthodium*, *Cyananthus* and many other

peculiarly Himalayan genera never did grow in Europe, nor have they yet ventured outside the Himalayan region. They are the parvenus of the mountain flora, not very sure of themselves in good society, so we find them gauche, difficult and rather unadaptable. They are all right in their own sphere, but they have not the cosmopolitan ways of the well-travelled, and they lack that confidence in themselves which is so necessary to good living.

Consider the lilies . . . I have said that, although they are north temperate plants and grow in open places, yet they are not alpines. The vast areas of the Himalaya and of Tibet are particularly poor in lilies. More than that, this region is poor in bulbous plants generally. There are plenty of Alliums, species of Lloydia, and the two lily-like genera mentioned above, besides several true lilies. At Tahawndam, at 6000 feet, grew *Lilium yunnanense* (like *Lilium giganteum*), the only lily in the valley. Then at 9000 feet there was *Nomocharis pardanthina*, locally abundant, and at 11,000 feet *Nomocharis Souliei*, also abundant. At 13,000 feet *Notholirion campanulatum* and *Nomocharis nana*, together with species of Allium and Lloydia. But this cold, sunless climate and sodden soil does not provide conditions such as bulbous plants love, and underground stems usually take the creeping form of rhizomes.

In the high glens, where snow-beds persisted, alpine plants were pushing through the moist black soil as fast as the slowly melting snow exposed it. They formed an irregular fringe, like flotsam on the edge of the tide. Thus, in August and September, June flowers were still opening their buds, though many of them would never ripen seed. Even so late as October 5th, at 13,000 feet I found several saxifrages, three species of *Pedicularis*, a *Cremanthodium* and *Gentiana phyllocalyx* in bloom where, in August, snow had lain deep. Ferns and grasses crept like a green tide over the black earth. Still later, on October 13th, two species of *Corydalis*, several *Compositae*, *Draba alpina* and a *Potentilla* were fattening their flower-buds. These delayed-action plants, taking no heed of the calendar, grow when removed from cold storage, until checked by frost. But there is another group of plants which behave differently. Most gentians, *Cyananthus*, and a dwarf monkshood, grow on the steep gravel screes, which face south and so are bare of snow at the end of May. They need three months of rain before they will grow away; you can easily pick them out, in June or July, small, disconsolate mats, starving themselves for a taste of sunshine. Then, in the fine autumn weather, after the rain, they grow rapidly and burst into flower. Now they do not mind if it snows; they will flower and even ripen their fruit in the early winter snow, so long as they are freed from snow in the spring. So it comes about that the flora on north alpine slopes differs considerably from that on south alpine slopes; each follows a rhythm of its own, controlled by the melting of the snow.

While climbing in the East Hanging Valley one day, I lost my rucksack. I had climbed the high conical scree to the base of the escarpment, and, finding my rucksack inconvenient, I unslung it and settled it on a rock. I had barely turned to continue the ascent when I heard a stone fall. I glanced over my shoulder and watched,

fascinated, as the rucksack toppled over and began to slide — oh, so gently at first! — down the slope. But there were things in it, and almost immediately it began to roll. Faster and faster it flew down the slope, turning over and over till it was lost to view. Though we sent a search party out next day, which traversed the wide base of the cone, we never found it. If it kept to the centre line it must have rolled into the river, and if it diverged to the side it was lost in the bushes. With it went my field glass, trowel and other important things.

We were able to indulge ourselves now, in the way of food, and, when out for three hours or more, we permitted ourselves a lunch-ration of figs, raisins and chocolate. Nevertheless, on the high and hostile screes I often found it too cold to stop and eat lunch; or in the excitement of the search for new plants I forgot to eat it.

And plenty of plants there were. Over the piled, angular rocks of an ancient moraine spread an emerald film of pygmy willow, and embedded in it like crystals were exquisite flowers. Afar off *Diapensia* stained the slope carmine, and under the cliff grew sheaves of stark yellow *P. serratifolia*.

I was climbing up the East Hanging Valley, making for the crest-line. Streams of the incandescent-red *Rhododendron repens* trickled like boiling lava over the rock-ledges. From terrace to terrace over the *roches moutonnées*, I climbed. Here I noted the lolling red tongues and shining green leaves of *Polygonum Griffithii*, finest of alpine polygonums. The paired flowers of *Primula Dickieana*, on stems half an inch high, ranging in tone from mauve and violet to purple and magenta, blazoned the turf. Near the top only four pygmy rhododendrons survived — the rather melancholy *R. campylogynum*, more gloomy by comparison with its vivacious neighbour *R. riparium*; the creeping *R. repens* and the brittle-looking *R. crebreflorum*. The mountain was composed of platforms of decreasing size, set one on top of the other, like the tower of Babel. Flowers clustered along the cornice and clung in cushions of blossom to the cliffs. An extraordinary little crustaceous plant, plastered like a lichen to the rock, was *Primula triloba*, though the small purple flowers are not bright.

On the sheltered side of the snow-packed gully the rhododendrons, even at 15,000 feet, still formed a thick but low scrub. *R. chaetomallum* grew here, its interwoven branches growing first down the slope, and then curving upwards like a fish-hook. Mixed with it was an aromatic-leafed shrublet, each leafy shoot ending in a bunch of little cherry-red flowers standing straight up on long, thin stalks. The aromatic leaves are snow-white underneath, flecked with golden scales. Sometimes there were as many as four flowers in a bunch, but two or three were more usual. I called this species *Rhododendron rubriflorum*, but it looked very much like a natural hybrid between *R. campylogynum* and *R. pruniflorum*, both of which grew here.

In the Adung valley flowering plants ceased above 15,000 feet, though here and there an alpine cowered under a rock. In Tibet, however, where there is more sunshine and less snow, many beautiful flowering plants commonly grow far above that level.

The Corydalises are alpine rock- and meadow-plants, usually bi-coloured, with flowers beaked at one end and

spurred at the other; they look rather like children's crackers tied to a sprig of foliage, and there must have been a dozen species in the hanging valleys above Lung Sa. Two stick in my memory. One I found on a dreadful scree, when a thick mist hung over the mountains, and a deluge of cold rain numbed me. At every step I took, the scree came crumbling away with a torrent of water which filled my boots. Then I saw the baby-blue-eyed Corydalis, its clusters of beaky flowers bobbing over the feathery foliage. In youth the leaves are purple-tinged, but later they turn blue-green like the shallow seas; and so finely cut are they that they reminded me of those seaweeds which float fern-like in the rock-pools between tides. Later in the year, the plant throws up fountains of sapphire-and-white flowers.

A second lovely species has vaporous orange flowers, stained walnut-brown on the spurs and on the tips of the lateral petals, and filmy leaves.

On the high barren cliffs grew a Potentilla of veteran mien. One might compute the decades which had passed since the first bunch of leaves spurted from the scaly-brown root-stock, for each annual growth was marked by the closely imbricated persistent leaf-bases. Stems a foot long — some were much longer — were a quarter of a century old. They writhed snakily from joints in the reinforced armour-plated granite; and one wondered how seed had ever reached that high crack, and how it had germinated when it did. The tufts of sea-green leaves, their silvery hairs combed smooth and straight, are almost hidden beneath the large tangerine-coloured flowers borne fluttering on thin, flexible, reddened stalks.

Owing to the way in which the creeping stem, though advancing only a fraction of an inch annually, divides and subdivides, there is built up a firm cushion, capable of retaining sufficient moisture for the plant, and anchoring it on the perilous cliff face, while the twisted cable of the root plunges far into the living rock.

But if I were to tell of all the alpine plants in the Adung valley this book would be immeasurably lengthened. I must pass on to other happenings.

How to get transport — now that we were isolated — that was the immediate problem. Visitors from Tahawndam were rare. One day we returned to camp in the afternoon, changed, had tea and were just settling down to work when we heard voices outside. Next minute Ba Kai came in and announced visitors — not from Tahawndam. At his heels entered a sturdy Chinaman and three Tibetans, one of whom I judged, from his dress, to be a man of some wealth and position. Surprised, I bade them squat on the floor. The Chinaman gave us greetings. He had come to ask if his partner — indicating the well-dressed Tibetan — and he might come into the Adung valley to dig *pai mu* (the bulb of *Fritillaria Roylei*). The party, he said, consisted of some twenty men at present camped on the other side of the mountains, who were afraid to cross over when they heard that Englishmen had come to the Adung valley. But he knew it would be all right, he said confidently, and so, accompanied by his Tibetan friend, he had come to pay us this visit. He added, by way of reference, that he came from the Mekong, that he was a Catholic and that he knew all the French Fathers there.

As I had myself travelled on the upper Mekong and had stayed at the villages he mentioned, I was on home ground, so to speak; and the astute Fan Li, seeing this, made the most of his opportunity. The praise he gave to the 'good foreigners', especially the English, would have brought a blush to the cheek of more credulous listeners than myself. Meanwhile, the Tibetans, who professed to understand no word of what was said, were peering about the hut. I inquired about the Tibetan who was the head of the party and was told that he came from a village in the Salween valley, to the east of us. I had, it appeared, stayed at his house some years before, and found no reason to love him. I looked at him and distrusted his shifty eyes, his morose silence, his perpetual peering, his nervous fidgeting — everything about him.

I was tempted to refuse these marauders permission to enter the Adung valley, where they had no right to be, especially in view of their avowed mission and the complaints I had heard against them. But, after all, the bluff might have been called. If the party intended to come over anyhow, with or without leave, how could we prevent them? We might organize the Darus into a defence corps, but what would happen to them next year? The idea was fantastic. But I had more cogent reasons for making friends with these people. We were very anxious to cross the pass ourselves and explore the route into Tibet. Tahawndam held out no prospect of transport, but in Fan Li I recognized a possible ally, if rightly handled. I meant to use him. When the Tibetan gentleman brought out his presents, therefore, and added his request that they might come and work in the valley, I answered in the 'diplomatic affirmative'. The presents were neither numerous nor costly — two pairs of rather gaudy, hand-woven cloth garters, such as the Tibetans use for binding round the tops of their long boots, into which the ends of their short trousers are thrust. We gave them some cigarettes and an electric torch, and they departed to Ba Kai's hut to find out what they could about us with the aid of that young man's limited vocabulary.

Mano was still sick. The Kachins have no stomach for the high mountains. Our visitors pitched their tent a mile up the valley, just beyond the last patch of silver fir, at the base of a huge scree. It was of white hemp cloth, with a light blue border, supported by two poles, forming a simple canopy. Then the Chinese went back over the pass and called up the workers. Later when I visited the pass, I saw a line of men, high on the scree, working gradually upwards. They were hacking up the fritillary bulbs, using a short one-handed pick, a most useful weapon for the botanist.

A few days after that, Fan Li came again to our camp and asked permission to take his men down the valley. They had cleaned up the main valley, he said, and wished to visit the north main valley above our No. One camp. The next morning we watched the procession of thirty streaming across the bog; they had to come by our hut, which commanded the path, and when I saw them close to I was sorely tempted to say, 'They shall not pass'.

They were awful. A more unsavoury lot of ruffians I have rarely met. A mixture of Tibetan, Lisu and Chinese,

the riff-raff of the highland border, they all looked capable of committing any crime. They were tall, with long hair, dressed in ragged hempen gowns hitched up round the waist. Each man carried a heavy basket of *tsambe* or corn-flour on his back, and a long thin gun with pitchfork rest. Some had knives. They carried a fortnight's rations, Fan Li told me. However, inside a week they were all back again. The Tibetan leader had had a fright and was hastening back to his own side of the mountains. Perhaps he was uneasy at our veiled hostility and our tactical position between him and his base. Anyhow, Fan Li said scornfully that his partner was afraid. It was to our advantage, because the partners wanted to sell us their surplus rations, and we were glad to buy, even at the exorbitant price demanded. When I said we had enough, moreover, the price fell to something almost reasonable.

Our Tibetan aristocrat looked magnificent in a red shirt and blue gown. He had slipped out both shoulders, and tied the arms round his waist. He wore a fur-lined cap with gold braid, and long leather boots. His thin silver pipe was thrust jauntily through his sash, at the back, and he carried a formidable, if primitive, gun. I could not help wondering to what band of reformers he had dedicated himself, but it appeared that the colour of his haberdashery had no political significance.

We inspected the contingent closely; they had the air of men who have just fought a pitched battle at long range, but we could detect nothing irregular. One of the skirmishers carried a German magazine rifle. There was a rumour that a large body of Lisus, also in search of *pai mu*, had come up from the south to Adung Long; possibly there had been a clash, or our scouts were making a strategic retreat according to plan. The time had now come to ask the Tibetan point-blank for transport to take us to Jité. Rather to my surprise he refused. The Tibetan officials, he said, would beat him for letting us through, and he dare not do it. This was the more curious because he claimed to possess a wonderful medicine, made by the lamas, which he swore rendered swords and bullets nugatory; and, after all, bullets are more than whips, or even scorpions. The medicine was not taken internally, but was carried in a silver charm-box, encrusted with coral and turquoise, which he wore strapped round his waist. He refused to show me the mascot. Though we, in our climbing rig, dirty with wood smoke, looked shabby beside his Magnificence, I was pleased to note that he coveted our firearms, steel boxes, field-glasses, tents, furniture and other household goods. So he left us, and departed to his own country, where I hoped we should now have a good reputation, for he left behind him two or three fever-stricken men, whom we dosed with quinine and sent on after him. But Fan Li stayed with us for a while.

The next social event was the departure of Fan Li for Tahawndam. I bade him tell the headman I wanted coolies at once, but he returned three days later with a message from Tsering saying that he would send coolies when the maize was ripe. As this was the third separate reason in two months for not complying with my request, I had no further illusions as to when the transport would come. Plainly we must have patience till the Greek Kalends.

But Fan Li did not come alone. With him were two Daru coolies carrying big baskets of skins which he had purchased. I was indignant that he should be able to get two coolies while we could not get even one. But Fan Li pointed out, reasonably enough, that it was easy to get one or two coolies, but what use was that to us who wanted a dozen? As for the baskets of skins, they had no doubt been purchased in the ordinary way. Burma sends skins and medicinal roots to Tibet, the Darus supplying transport. Tibet in return sends clothing, cooking-pots, salt and *tsamba*, to Burma, the Darus fetching these things for themselves. The Tibetans pay the Darus a nominal price for what they buy; the Darus pay the Tibetans a phenomenal price for what they need. But the volume of trade between Tibet and Burma is not large.

One interesting piece of news Fan Li told us. Our hut had been overwhelmed by a landslide. A mountain had come down during the night, threatening to abolish the Tibetan settlement, but had stopped just in time. Only the Base Camp was utterly buried. This was his parting shot as Fan Li went off to Tibet with his two men, and we expected to see him no more. My last words to him were, 'Send the men of Jité to me'.

I learnt something about the mysterious *pai mu* industry from Fan Li. The bulb, or an extract of it, is reputed to cure fever. I found it, when I tasted a scale of it, if not exactly bitter like quinine, at least as pungent as red pepper. In Yunnan *pai mu* sells wholesale for eight dollars per *kin*, or about seven and sixpence a pound, at the current rates of exchange (in 1931). But it is the big seaport cities, Shanghai and Canton, which buy the stock, and by the time it reaches those distant places it is worth almost its own weight in silver. The profits of the Fan Li partnership could not have been high. Labour was cheap and it cost little to feed these hardy folk off *tsamba* and buttered tea. But they had to come a long way to get the *pai mu*, and there was no sale for it nearer than Atuntzu in Yunnan. There was a commission in kind to the diggers, too; the Tibetan said thirty-three per cent, but that seems excessive, and as the bulbs are useless to the coolies they exchange their share for food or cash.

There remains the question of extermination. But here even the well-known rapacity of Chinese medicine-mongers kept itself under control. The diggers spared small or immature plants, and when I ascended a scree behind the skirmishing line which worked diagonally across its face, I found plenty of fritillaries. Every plant produces scores of seeds, which germinate readily; there must be millions of plants in these hills.

Fan Li told me that when there is a heavy winter snowfall the fritillary crop in the following summer is good, but when there is not so much snow it is poorer. But he could not account for the connection.

CHAPTER XX

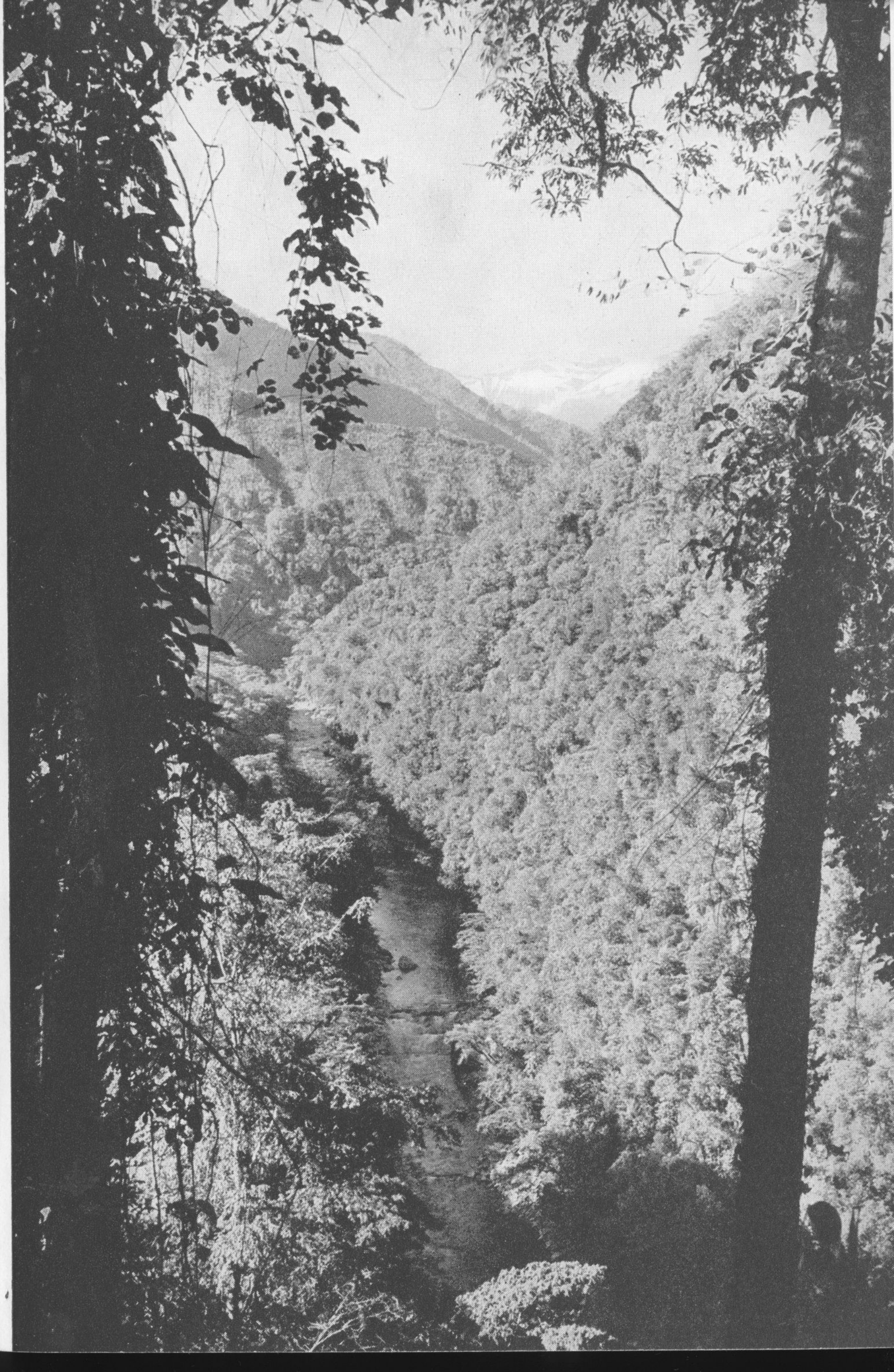
A DEAL WITH FAN LI

A FINE day in the hills during the monsoon is doubly welcome, first because it is fine, secondly because it is a surprise; and so, when on July 27th the morning sun peeped over the ridge and shone straight into the hut, I felt I must commemorate such a rare occasion. After an early breakfast I set out to climb the waterfall valley across the river. In the bamboo thicket a pair of blood pheasants were strutting. They are gay birds with vermilion legs and apple-green breast slashed with crimson, and the throat also is crimson; the rest of the plumage is grey, but soft and full. The tail is short. These birds have a way, while pecking at insects and young shoots on the ground, of jerking up their heads as though to listen, at the same time uttering a shrill, querulous cry. Yet owing to their ignorance of man — for they live in dense uninhabited forests — their temerity amounts to foolishness. They are difficult to shoot only because they are difficult to see. Cranbrook shot one in June, on his way up the valley. In August he shot another. In November, while we were in the ten-day camp, on our way back to Tahawndam, a large family of blood pheasants stalked into the firing line one morning, and five of them were casualties in as many minutes. It seemed unkind to shoot them; they took no notice of us, and Cranbrook knocked them over one after another like coco-nuts at a fair, while they took little squawking runs this way and that, trying to disperse, but not connecting their discomfiture in any way with us, and uncertain where to seek cover. The young ones had evidently never seen a man before, still less a gun; it was something beyond the range of their experience, and they were distraught.

Above the waterfall — it was not a vertical fall, but a series of short cascades — I entered a beautiful alpine valley; and, fifteen miles away to the west, hidden in the frothing clouds, saw Burma's highest peaks. They form a cluster of nameless white pyramids between the Adung valley and the Zayul (Lohit) river in Tibet.

A beautiful mossy saxifrage, with a solitary golden moon flower balanced on the end of a short leafy column, grew on the grassy ledges of the cliff, and yellow pools of *Primula serratifolia* lay in the wet hollows. On the highest and steepest grass slope, where the wind whistled over the 15,000 feet pass, the cathedral-window-blue trumpets of a mat gentian (*G. filistyla*) reflected the sky. The flowers close when it rains and become so dark in colour as to be almost black; yet a few minutes later, when a ray of sunshine slips between the clouds, so sensitive are they that they at once begin to uncoil, until presently the bank is blue with them again. The plant does not carpet the lawn, but occasionally you see five or six radiating flowers. By the stream, lower down the valley, colonies of the sky-blue prickly poppy (*Meconopsis horridula*) grew, and tall thistles, mantled in woolly white cobwebs.

It was not till August 14th that I at last went right



[*facing:* LOOKING NORTHWARDS UP THE NAM TAMAI to the Namni pass and looked over the other side into Tibet. Climbing 1000 feet out of the main valley, I found myself trudging up a snow bed between bare granite walls. There were footmarks in the snow leading to the pass. Men had been up and down. Before I reached the top, two people appeared, coming down. Though dressed in Tibetan clothes, they were not Tibetans, but Taron slaves.

The pass was a mere gap in the ridge — as though a tooth were missing. If you stood on the pass and shut your eyes and turned round three times — a feat requiring some agility and balance — it was impossible to tell, when you opened your eyes, whether you were looking into Burma or Tibet. The Burma of popular belief — a langorous, fragrant, green land bathed in sunshine — is in direct contrast with the Tibet of popular belief — an icy, storm-swept, barren tundar. But where Burma meets Tibet it ceases to be Burma, and where Tibet meets Burma it ceases to be Tibet; and this harsh and savage border has indeed the worst of both worlds. Anything less attractive than the first peep over the brink into the Tibetan valleys it would be difficult to imagine.

The clouds rolled like grey smoke up the ravine, and it rained without stopping. The wind whistled between the bare granite cliffs. Yet even in this hostile climate of bitter wind and snow and slanting rain, there were flowers. They poked their wan faces up from beneath the shelter of harsh and unfriendly stones. Such Spartan high-altitude plants as *Draba alpine*, glittering with the gold dust of its tiny yellow flowers, the cowering *Primula triloba* and *P. congestifolia*, a crimson beauty, and dainty

Cremanthodium survived. It was a chilly spot, not so much because of the altitude, but because the sun did not reach it, and the snow lay deep all the summer.

The whole of this country is so compressed, the gorges so deep and narrow, the ridges so high and steep, that it is impossible to get an extensive view of it. You climb the ridge on one side of the valley, and from your vantage point, 15,000 feet above sea-level, you can look across the valley and see the ridge on the opposite side. The distance is only two or three miles. Beyond that you can see nothing, save here and there the tip of a peak showing through a gap. How different it must have been before these deep valleys were scooped out, when the whole country was a vast plateau, part of the plateau of Tibet, with an average elevation of 16,000 feet. In the Adung valley, a glacier descended at least as far as Adung Long, and that glacier was at least thirty-five miles long; the remnant of it which remains to-day is not half a mile long. Every valley had its glacier, and it is certain that something very like an ice-sheet covered the country from the Lohit valley in the west to the Salween valley in the east. Indeed the whole of the north-east frontier of India from Assam to China was glaciated over an area of not less than 10,000 square miles. One plain relic of the ice has been left in the Adung valley. Moraines and perched blocks have been washed away or at least overgrown; but the ice shelf — a broken cornice high up on either wall of the valley, remains. It marks the old high-level valley-floor which cradled the glacier.

On a day of better weather I watched long-tailed

sunbirds in the meadow at Lung Sa visiting irises. It was like a scene from the tropics. These sunbirds are as brilliant as humming-birds and no larger than many butterflies. So light a weight are they, so rapidly do their tiny wings vibrate, that they are able to halt, poised in mid-air, for a full minute, while with their long curved beaks they extract honey from the flowers of their choice. Amongst English birds only the skylark and, for a briefer time, certain birds of prey can hover motionless. But these flimsy flowers were made for insects not birds: birds, however small, cannot settle on them as do insects, and it was pretty to watch these clever little creatures probing between the petals for honey, exactly like a long-tongued insect which had alighted on the flower. The iris, with its cunning contrivance of formation to ensure that the seeker after honey shall, willy-nilly, take pollen too, and transfer it from flower to flower, was no puzzle to them.

August jogged along slowly. We had settled down to our alpine life, which, if not even faintly exciting, was never wearisome. In the beginning, we had rationed Lung Sa Camp for two months, thinking that we should be in Tibet before then, and able to buy local supplies. Here we were well on into the third month and as far as ever, it seemed, from getting into Tibet. Luckily we had been able to buy supplies from Fan Li. I now decided to send Mano to Fort Hertz with our mail, further lightening the strain on our resources. Mano was ailing. One day he had a hacking cough. The next day he was down with fever. The altitude was too much for his weak constitution. So down to the plains he should go.

And then, without warning, came a gleam of hope. Fan Li again appeared before us, like the jinn in the pantomime. He professed to be disgusted with his poltroon of a partner for his undignified exit. He had, he said, returned on his own, with seven or eight men, to dig up bulbs. He brought a few small gifts to make his peace with us, including a fid of butter wrapped in a leaf. I made up my mind to bribe him to take us to Jité.

Next time Fan Li looked in for a cigarette and a chat I sounded him. I felt sure that he had his price, and that if I named the minimum wage, fears, scruples, and any other inhibitions would just vanish into thin air.

'You could take us to Jité, Fan Li?' I said.

For a moment the Chinaman smoked in silence. I could almost detect the alternating current of his thoughts.

Then:

'When do you want to go, sir?'

'We are ready now. To-morrow, if you like.'

'Not to-morrow. In a week perhaps, if I can persuade the men. They will not like it. But if I tell them you will pay a good price they might go. How many coolies will you want?'

'Ten or twelve. We will pay them well.'

Fan Li looked relieved. So, having planted the idea, I let it germinate.

On August 21st two men from Tahawndam arrived; but not on our account. One was the lama: the other, his servant, was a half-wit Daru, a globular monster of simian appearance. He had long arms like a gorilla, but his grin was more friendly than a gorilla's. Though

only a little over four feet high and almost as broad, his strength was terrific. I had seen him wrestling with another giant pygmy at Base Camp, both of them thewed and sinewed like a pocket Hercules. The lama was going on pilgrimage to a distant monastery in Tibet. He reported first of all that the Darus refused to cross the pass with us because they were afraid of what the Tibetans would do. The Tibetan bulb-digger had already beaten them because he alleged they had been poaching his bulbs instead of bringing him skins. Next day the lama revised his statement. He said that, when the Tibetan bulb-diggers visited Tahawndam, all the Darus had run away, and hidden in the forest. Now that the Tibetans had departed, they would emerge from their bolt-holes and take us to Jité. But if they had really run away and hidden, there could have been no atrocities. So perhaps darkest Burma in the twentieth century had no uneasy secrets after all; or at any rate the Adung valley had not. It was difficult to deal with Tahawndam through such equivocal messengers, even if we had had fluent interpreters, which we had not. I dealt with Fan Li myself; though far from fluent in Chinese—I was the only person present who knew any at all—I knew enough for the purpose. I decided to place my trust in Fan Li. By the time of his next visit, he had already made up his mind; and we clinched the bargain over a mutual exchange of presents. It was August 22nd. Fan Li and his party were going down the valley to dig for bulbs. They would be gone for a week. When they returned we would go to Jité.

Thus it was arranged. Fan Li was rather better than his word. He returned to Lung Sa on the 27th. Business had not been brisk, and he was just in the mood to do a reckless deal. We agreed to start on September 1st, and now we tackled the knotty problem of what to take and what to leave behind. The first part was conditioned by the fact that only nine coolies were available, two or three having declined to take part in so irregular an expedition. This, however, we did not learn till afterwards. What Fan Li said was that we could take twelve loads, but they must be very light, because his men had loads of their own to carry. This was fiction; they had finished their supplies and had practically nothing to carry. We were paying by the load, and if nine coolies could carry twelve loads, so much the better for the foreman. In the end, Fan Li produced only eight coolies, the ninth being our own Daru coolie. He himself disdained to carry anything—Fan Li had an acute appreciation of the meaning and uses of prestige. We made up the twelve light loads, comprising bedding, small tents, drying paper and presses for plants, a week's rations of rice and flour and a few stores. We had to leave ten days' food-supply at Lung Sa, as it would take us at least a week to communicate with the village on our return. We took no firearms, being concerned for the religious feelings of our future hosts — quite unnecessarily as it turned out. However, Cranbrook did take a few traps. Everything we left behind was locked up in our steel boxes and piled in the hut — except our treasury, which was to be buried at our first opportunity with all the ritual of a private romance, secret marks being cut on the trees to guide us afterwards to the place.

On the very day that Fan Li returned, two Darus arrived from Tahawndam. They were a present from the headman: that was all he could do for us. On the 27th, Mano left for Fort Hertz, carrying our mail. This had theoretically been accumulating ever since May; but, such is human nature, most of our letters had in fact been written the last two evenings before Mano left. There is something fundamentally unpleasant about writing a letter and keeping it for three months before sending it away. We sent one of our newly acquired slaves down with Mano. The other we kept.

One more visitor we had during this pregnant time, when, for a week, more people came and went up and down the Adung valley than during the whole of the rest of our vigil at Lung Sa. This was the ape-man. He had parted from the lama at Jité and was returning to Tahawndam.

The last few days of August were wetter than ever, and there seemed little prospect of the weather mending before we started. Vast masses of cloud rolled remorselessly up the valley, and the rain came down in blinding sheets. I collected a few plants in the bog, including seed of the brilliant little blue Gentianella I had christened 'ocean star'. Though only half an inch high, with tiny flowers, ocean star occurred in such numbers as to glaze the ground sea-blue.

We celebrated August 31st in the usual way and finished our packing. In the evening Fan Li and one of his lieutenants called in to look at the loads, and pronounce a blessing. So we knew that at last we really were going over the Namni Pass.

That night at dinner Cranbrook and I could talk of nothing but the coming journey. It was the climax to our long stay in the Adung valley. Our suppressed excitement kept surging up.

'Tibet is a beautiful country,' I told him. 'At least the inhabited part is.'

'Shall we see great monasteries with golden roofs?' he asked.

I doubted that. Big monasteries are confined to the dry plateau. In the forested mountains of south-eastern Tibet, the buildings are all made of timber and are generally quite small. The villages, too, are small and widely scattered, and the people of mixed descent. The climate is very different from that of the plateau. Here, too, nine-tenths of the floral wealth of Tibet is concentrated. No description of Tibet in the neighbourhood of Mount Everest, for example, or Lhasa — or indeed any of the half-dozen principal townships of Tibet (large villages is a better description of them) — will give any idea of this region, with its mighty rivers, its deep gorges, its snow-peaks and glaciers, its forests and meadows.

Nor could we expect to reach a country very different in appearance from that of the Adung valley. We were too far away from the plateau and travel in this country is slow. We might, however, reach *drier* country, for many of the river gorges are arid. It seemed idle to speculate. In a few days we should know all about it.

CHAPTER XXI

TIBET PROVES UNFRIENDLY

We rose while it was still dark, breakfasted in silence at an intolerably early hour, finished our packing and sat down to wait. We waited an hour, two hours. Had Fan Li cheated us? It seemed so; but in fact it was only the tradition of the East. The earlier you rise, the later you set off, a discomforting paradox. At ten o'clock the coolies arrived, with Fan Li smiling a satisfied and avaricious smile: but the rank and file looked gloomy, like the weather. At ten-thirty we started. Rain was coming up the valley in bursts, and cloud mantled the peaks.

No sooner had the last coolie started than Cranbrook and I, who had hung behind, sneaked outside and buried the bullion in the forest in two separate places. We felt conspiratorial as we pushed the string bags of rupees down into deep caverns under two colossal boulders and heaved lumps of moss on top of them. Appointing two trees in line with each cache, we blazed the trunks, to guide us on our return, and came away. Then we filled with stones the two ammunition-boxes which had hitherto contained our rupees, screwed the lids down and left them in the hut to be stolen. We found them intact on our return, but had great difficulty in finding one of the caches.

We had not been up the valley for some days, and I was surprised at the change in its appearance. Everything had grown enormously; the vital acceleration at the end of the summer, when temperature and humidity reach their peak, was very evident. My giant variety of *Cyananthus lobatus* sprawled richly over the gravel banks, daubing them periwinkle-blue. With it, huge hassocks of *Sibbaldia melinostida* bulged outwards till they burst in showers of maroon-red, starry flowers, which fluttered in the wind. We soon overtook the coolies, who found the loads heavy and went slowly. Our own rucksacks were not light: mine weighed twenty pounds, while Cranbrook's was heavier. When we reached the top of the hanging valley which leads to the pass, we sat down under a big rock to eat our lunch and be out of the way of a great deluge of rain which now assailed us.

The wind was cold, like our lunch; we were completely waterlogged and shivering; but a rest was necessary. With our heavy loads, the pull up to the pass, over the confused boulders and steep snow, was exhausting. Seeing me lag behind, Fan Li, who was carrying nothing himself, suddenly became solicitous and offered to carry my rucksack for me. I gave it him. We reached the top at 3.30 p.m. and looked down into Tibet. But all we saw was a forbidding, treeless, rocky glen, with a snow-bed at the bottom and a lake. The valley was blocked by perpendicular cliffs, crowned by steep, crumbling ridges. All round us, the granite cliffs and jumbled grey boulders were utterly bare, and an icy wind whistled about our ears. It took Cranbrook half an hour's painful labour to get a boiling-point reading, from which we worked out an altitude of 15,300 feet for the Namni La.

We slithered down a high scree and landed on the snow-bed below. Crossing this, we reached the bluest sapphire lake I have ever seen: it lay in a bowl whose sides were encrusted with golden saxifrages and shimmering glassy-blue bubbles of *Gentiana Wardii*. The flowers on the Tibetan side seemed to be larger and more brightly coloured than in Burma, but this may have been only my fancy. Plants which were quite rare in the Adung valley were common here. After going round the bowl overlooking the lake, we descended a cliff over which the stream from the lake plunged down into a larger valley, with three shrunken glaciers at its head. Sheaves of yellow *Primula sikkimensis* grew by this stream amongst thickets of willow and rhododendron. Lower down, we had to wade the icy water knee-deep.

It was dusk when we reached the first straggling fir trees. I was tired out, wet through and very cold; but the coolies did not halt here, as I had hoped. I had been digging up plants and was too far behind to protest. At last I came up with them. We had to halt because it was almost dark, but there seemed to be no room to camp. However, we managed to rig up a rough shelter amongst the trees and rocks, using only the tent fly; but it was an hour before a very sulky fire burned. We spread our bedding under cover and eventually got something approaching a warm supper. It was still pouring with rain. But what of it? We were on the move again, after that exasperating three months' stagnation at Lung Sa; and we were in Tibet, land of many mysteries, exploring an unknown and significant route.

Next morning we had the hateful job of packing wet tents, and our fingers were soon numb. It still rained and never looked like stopping. We descended the steep valley, picking our way among the ice-smoothed rocks, half smothered under stunted rhododendron bushes. Near by, the torrent crashed down in a crescendo of cascades. Gradually the forest thickened, as the glacier-worn slopes gave way to more broken country, and soon we reached a third valley larger than either of the other two. A milky stream from an invisible glacier flowed at the bottom. Turning north-eastward, we almost immediately came out into a wide level pasture, much larger than Lung Sa and much drier. Scores of yak, sheep and goats were grazing on the plain, which is called Kasaling. In one spot the ground was hummocky with tussocks of dwarf 'Lapponicum' rhododendron. A few lingering flowers of ill-favoured purple suggested that it was the same species as the one at Lung Sa.

The Tibetan herds were not cordial. Fan Li was in earnest conversation with a saturnine-looking man who eyed us obliquely, and I felt convinced that our ally was apologizing for bringing us. That he would cheat us without a moment's hesitation was more than likely. Presently a swaggering youth leapt on to a pony and galloped bare-back down the valley: he had gone to inform the village that unwelcome guests were on their way and to bring the priest. The church is all-powerful in Tibet. It is consulted in every difficulty.

Meanwhile, the rain had mysteriously ceased, and the sun struggled to emerge. It occurred to me that it might be wise to push on as rapidly as possible so as to forestall

the villagers, should they decide to bar the way. But I dismissed the idea, and decided to camp and dry our clothes instead, much to the chagrin of Fan Li, who was in a hurry to finish his share of the business.

We pitched our tents close to the black hair tents of the Tibetan herds, and I spent the afternoon collecting plants. Kasaling is at an altitude of about 12,000 feet, like Lung Sa, and close to the natural limit to tree growth. Like Lung Sa, it is a lake basin of glacial origin which has become silted up — the name means 'flat snow plain'. Round the edge of the meadow was a fringe of forest, mainly battered junipers, whose thick trunks were engraved with rosettes of orange lichen, while streamers of an apple-green species swayed from the angular boughs. Another tree was *Picea Morindoides*. The drier part of the meadow was spangled with flowers. Two that were abundant here, an aster and the scented *Cremanthodium*, were of interest because of their scarcity in the Adung valley.

Early next morning, the village priest arrived. He rode a gaily-caparisoned pony, which was led by the bearer of ill tidings: his luggage followed on a yak, and a slatternly woman brought up the rear. He was a sour-looking monk, dressed in a seedy red robe with an elongated red mortar-board on his closely-shaven head. I expected him to call on us, if only out of politeness; but he would not make even that gesture, and I realized that we were untouchables. Possibly the Tahawndam people, who had been backwards and forwards earlier in the year, had boasted about their guests, and the Jité folk were uneasy as to our intentions. Would we forbid the exploitation of the Darus and the root-raiders? Guilty consciences easily imagine reprisals. Whatever the reason, it was obvious that we were unpopular.

I told Fan Li to get us some milk from the herds, which he did. At first the Tibetan hesitated to take the silver coin I offered him. Then he asked for a rupee and finally for a box of matches instead. The milk was good, though not plentiful: it was the first fresh milk we had tasted for nearly four months.

Next day, we continued our march down the valley by a fair bridle-path. Almost immediately we crossed a large stream, flowing from the west, and the conifer forest became thicker, with heavy rhododendron undergrowth. The bridle-path kept close to the river, now greatly swollen, and wherever it was muddiest it was lined with bushes of the dwarf *Viburnum cordifolia*, whose crinkly leaves had turned gamboge, orange and vermilion. The glutinous black fruits were already ripe, and birds were eating them.

At noon we reached another big stream from the west, the Shori chu, up which lies the route to Zayul. The sun came out, and we sat on the river bank and ate our lunch. I was sorry it was not spring, and the rhododendrons in bloom. They would have made a wonderful display, though there was not the variety here that there is in the Adung valley. As we continued to descend, the air grew warmer. From forest we passed to high meadow where there were scattered bushes of *Rosa Moyesii*, with scarlet, flask-shaped hips, and *Lonicera ovalis*, with vivid orange berries, and syringa (lilac): and then back again to forest. Next came more meadows, where tall and stately

flowers grew, golden *Trollius*, *Aster fuscescens* and notably a dazzling cathedral-window-blue larkspur. We were in a beautiful valley of flowers.

Towards evening clouds hid the sun. I dropped farther and farther behind the coolies, as I had to stop continually and collect plants, many of which I had never seen before. It began to rain, and I wanted to camp, being loaded with specimens. But the coolies went on and on. I came up with three laggards, just as we reached the first house, and told them to stop. But the inhabitants of the house had barricaded the door and fled, and from the safe vantage of the hill above they shouted to us to go away. So we went. A mile farther on, we at last caught up with the main body, including Fan Li and Ba Kai; it was now pouring with rain, and we were all wet through. I blamed them bitterly, pointing out that had we halted an hour earlier we might have been dry and warm. Fan Li smiled. But we made the best of it, built up a good fire and, in the end, managed to rig up the little alpine tent in which Cranbrook and I slept.

Resuming the march next day, we arrived at a meadow in the middle of which stood a mud wall supporting many stones, with prayers neatly engraved on them, a sure sign that we were approaching a village. Immediately after, we crossed, by an excellent wooden cantilever bridge, a third big stream, the Loking chu, this time flowing from the north. The main stream below this confluence was a formidable river, as large as the Adung river at Tahawndam.

We now left the river altogether and, ascending 1000 feet through the forest by a steep path, came out on a wide, gently-sloping terrace. On the other side of a cornfield stood half a dozen timber houses. It was Jité, the first village in Tibet.

After our reception at Kasaling we had no great hopes for our probable reception here. But so long as hostility was not overt, we were prepared for anything. As we approached the village, heads popped up out of the corn, and the harvesters stared at us. An old tousle-haired fellow with a scowling expression came forward and tried to shoo us off. But we trusted in Fan Li's guarantees and went forward with the coolies.

The houses of Jité are built of logs, with sloping roofs, and tiled with overlapping shingles held in place by stones. Living-room and stables were on the ground floor, and there is a loft under the roof for storing fodder and grain. We tried to persuade the sulky old man, who looked like Father Time armed with a sickle instead of a scythe (we called him the Dotard), to let us stay in his loft. It would be chilly and cramped under canvas and difficult to dry my plant-paper. But the Dotard grumbled that we should set the house alight if we tried to cook there and reiterated that all the houses were full: we must camp outside the village, the farther away the better. There was no level ground anywhere near the village, except the cornfield, and we searched for some time without success. Eventually we decided to pitch our tiny tents on a small platform cut out of the slope just behind the village, where there was hardly room to move at all.

I disliked Jité and its inhabitants on sight, and, drawing Fan Li aside, I tried to persuade him to take us to

Ridong, another three days' journey. But the wily Chinaman excused himself on the plea that he had to get back to China immediately. The village people would take us, he said. So I paid him and his men, counting the money out in front of the coolies and stacking the rupees in as many heaps as there were men, because I knew Fan Li intended to take most of it and hoped to embarrass him. Fan Li told me that the coolies would not agree to go for less than ten rupees each, but in fact they were not a party to the agreement: they had no idea of the high value put upon their services by Fan Li. Even their expressionless faces registered some emotion when they saw a hundred rupees at once. Later, perhaps, Fan Li had some difficulty in explaining the position to them, but, so far as I was concerned, the only result of the exposure was that he came to me and wept and raged until I gave him another ten rupees all for himself. Considering how he had behaved, he did not deserve this; but it was a cheap riddance. Fan Li and his ragged crew departed, leaving us to the neglect of the unfriendly village.

To the people of Jité, the annual influx from China was as unwelcome as ourselves, though the devil you're familiar with is better than the unknown devil. When the Yunnan contingent had taken themselves off, several villagers, including the Dotard, called and shyly confessed to an interest in us. In short, they wanted medicine for innumerable ailments. We gave it them wholesale, irrespective of symptoms, and were paid in butter, barley meal, curd and dried yak meat as hard as leather. It was a curry Ba Kai made of this desiccated gristle which upset Cranbrook. Milk was unobtainable because all the yak were at Kasaling, though they would soon be coming down from the alpine pastures. There were neither pigs nor fowls in the village. On the other hand, there were ponies and cattle, the latter being kept to sell to the Darus of the Adung valley who had to come and fetch them.

At first the disapproval of the local inhabitants was almost vocal. They were afraid to be seen associating with such low characters as ourselves, and when they visited us they came in sheepishly, glancing guiltily behind them. But they could not entirely avoid us, since we were sitting outside their back doors. The Church did not approve of our presence, and they took their cue from the Church. No Tibetan dare offend the Church. Even an unexpected medical success was taken as a matter of course, though hardly by us. Had I raised the dead, the resurrected would have denied it in the presence of the lama.

The people would not take us to Ridong for anything we could offer, and I began to doubt seriously whether they would even take us back to the Adung valley. The future looked black indeed. I therefore conceived the idea of sending our Daru to Tahawndam with instructions to bring help from our own village. But the help never came.

Then I tried to persuade one or two men to accompany us to Ridong, though I was loath to go at all unless I had full facilities for collecting plants, and that meant a coolie load of paper. But they were not to be tempted. Most of them were slaves of the Tibetans — pygmies

from the Taron, half-witted, deformed and hideous. To say that they were like apes would be flattery. One of these slaves had been lent us in place of the Daru who had returned to the Adung valley, but he was deaf and dumb, and we could get no sense into or out of him. He worked hard, however.

Two days after our arrival, the drums began to throb again, morning, noon and night, in the little wooden temple. The parish priest was back at work. He still shunned us; but there was a marked improvement in the attitude of the villagers. Their confidence in us increased daily. The unsavoury Dotard became a positive menace, and his cook-house scrounging ways and confidential conversations with Ba Kai suggested the most abysmal depths of spying. But Ba Kai, we knew, was staunch, and we learned something. When the villagers came and of their own accord offered to take us back to Burma, the innocent might have been touched. But I was not so innocent, nor did I regard the offer as touching. A Tibetan, saddled with an embarrassing guest, has only one idea — to get rid of him as quickly as possible by the same route by which he received him. For us, this meant over the Namni Pass. So I told them, 'all in good time'. We did not want to go just yet. But I would remember the offer.

I now realized that if we wanted to go to Ridong we should have to go alone, carrying our rucksacks. Both Cranbrook and I were sick, and it rained day after day, the clouds never lifting for more than two hours at a time. Right up to the day we left I felt that our Daru messenger who had been sent to Tahawndam might return with help, but in vain.

However, we were not idle. Jité and its neighbourhood comprises five or six wooden houses, with outside granaries. The main village stands 1000 feet above the Lokong river on a gently sloping shoulder. There is a path up the valley, but no through road. I followed it for a mile or two and found growing on it the charming and minute *Circaeaster agrestis*, its rosettes of glaucous, spoon-shaped, finely-toothed leaves beaded with silver rain-drops. This plant has a certain interest because it is the only species in the family *Circaeasteraceae*, and that family is one of only two endemic families on the Sino-Himalayan ranges. It was impossible to get far down the main river, which plunged into a gorge. The path to Ridong slants away to the north-east, up and down over the mountains; and, after crossing three ranges and two valleys, Ridong is reached, a village of fifteen or twenty wooden houses in a wide, grassy valley.

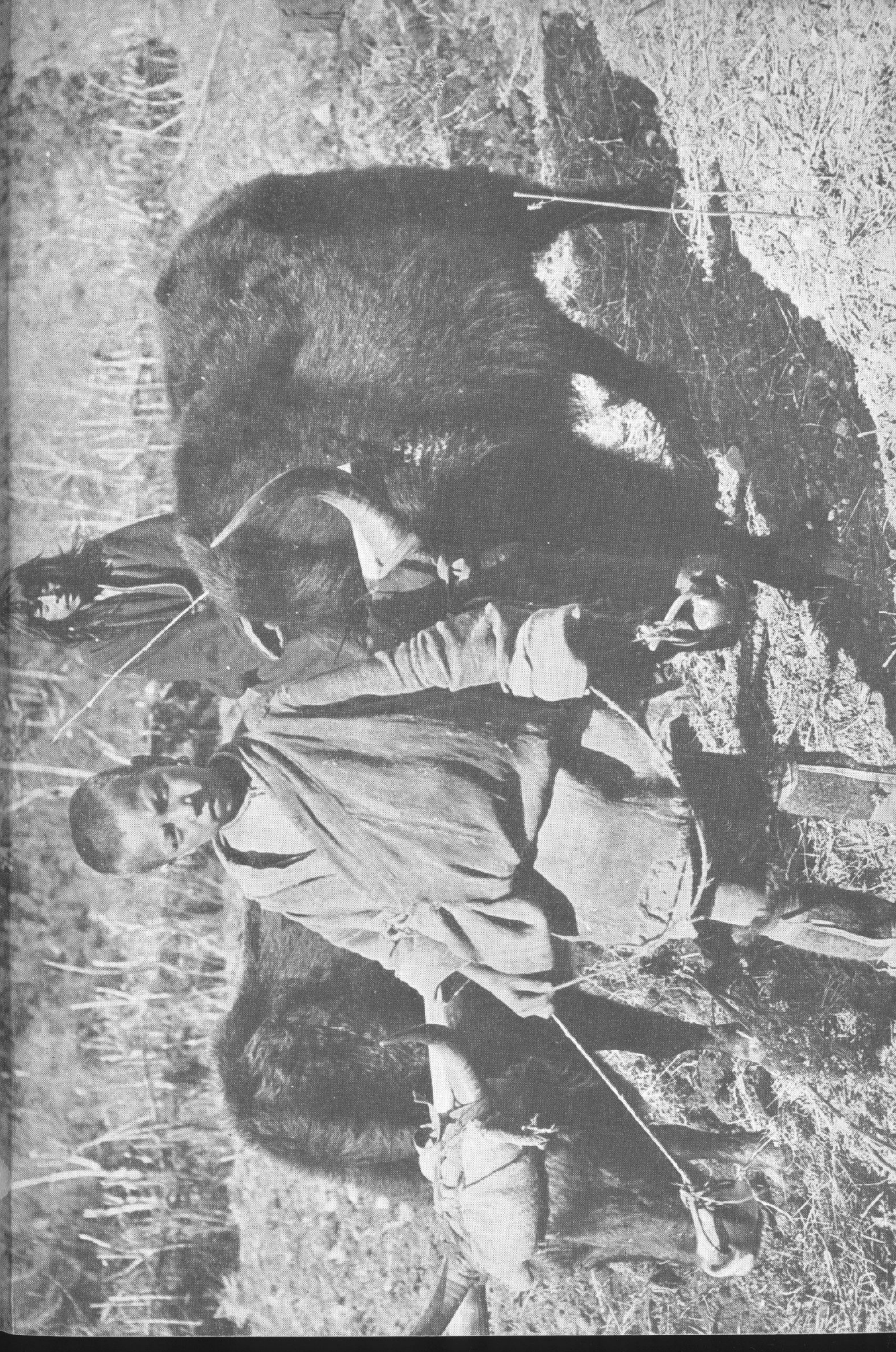
Cranbrook explored the Ridong road as far as the first pass, called Lachong La, at 13,108 feet altitude; and, two days before we finally left Jité, I went there, too. It was a vile day, pouring with rain, and a dense mist hid any view of the unknown mountainous country to the east. But the alpine slopes were still gay with flowers, though all else looked commonplace beside blue pools of the magnificent, trumpet-flowered *Gentiana Veitchiorum*. Under the straggling trees near the top, I found the fat, brown, caterpillar-like fruiting heads of the grape-hyacinth primula, *P. cyanantha*, from which I collected seed.

Beyond the cornfield was high meadow, very like an English meadow, except that it contained more flowers and fewer grasses. Here grew fragrant orchids, larkspur, globe-flower, *Primula capitata*, with a mop of rich violet flowers capping a mealy white stalk; also a handsome Allium whose innumerable star-flowers shot out in all directions from the top of the tall 'scape. Down in the river gorge was mixed forest, with pure stands of white poplar, on gravelly soils, and barricades of buckthorn. On the cliffs grew at least one rhododendron I had not seen in the Adung valley, the strongly aromatic *R. brevistylum*. Had it been spring, I might have recognized other new species. The common box grew here, but looked rather out of place. Not far from our camp, in a little glen, was a limestone outcrop with scattered shrubs and a wealth of interesting plants. Colonies of the incandescent-blue 'ocean star' (*Gentianella*) splashed the grey rock with piercing illumination, and there were a number of orchids, most of them recently over, besides grass-of-Parnassus, *Nomocharis nana*, and, in fruit, the wisp-like stem of the sylvan *Primula likiangensis*, from which I saved seed.

Behind the village, the steep mountains were covered with forest, mainly conifers, and thickets of rhododendron. By the middle of September many of the broad-leafed trees were colouring brilliantly, the most gorgeous being the maples, *Acer caesium* and *A. tetramerum*, birch, bird-cherry (*Prunus padus*) and rowan. The meadow, too, had changed not once but three times. When first we came to Jité, it was a field of golden *Trollius*, but gradually the gold was swamped beneath blue seas of larkspur. Now it was dead. Twilight had fallen over the short Tibetan summer.

It was harvest-time at Jité, another sign of approaching winter. Slaves worked in the fields all day. Agricultural machinery has not yet found its way to Tibet, and everything is done by hand. Before the corn is cut, the weeds are pulled up, tied into bundles and carried away to be dried for fodder. Weeds constitute a large proportion of the cornfield and include a very miscellaneous assortment of plants: I first noticed the wonderful *Cyananthus lobatus Wardii* as a weed of cultivation round the cornfields of Kongbo, southern Tibet, in 1924. After the weeding the corn is reaped with sickles, and the stems are pulled through a large wooden comb which takes off the ears, these being raked up and thrown into baskets, while the straw is tied up into stooks and left to dry. Finally the ears are flailed and the grain winnowed on a mud threshing-floor. Ploughing is done by a yak.

Potatoes and turnips were now ripe: they afforded a pleasant change from our usual fare. Then a yak conveniently died at Kasaling — our evil influence, perhaps — and the people brought us some fresh meat. Yak meat is like coarse beef. In a generous mood we gave the Dotard a tot of rum. That was the Open Sesame to his heart. Early next morning, he who had been most stubborn in opposing us on the day of our arrival, most prominent in the threatened boycott, crept into our camp and in a hoarse mumble offered to sell us maize-meal, *tsamba* and flour, all of which we had been trying unsuccessfully to buy for days. But we mustn't tell anyone. It was a secret transaction. Curious to learn more, we agreed,



[*facing:* TIBETANS PLOUGHING WITH YAK, IN THE ADUNG VALLEY and the Dotard furtively produced a hide-bag from under his ragged cloak, from which he poured a measure of *tsamba.* We paid him in Indian currency, and his red-rimmed eyes brightened. Glancing apprehensively over his shoulder, he whispered that he would return to his house for more and crept away. He came back and went through the same sinister evolutions, trembling with excitement and nervousness. When we intimated that we had enough, he merely increased the amount per rupee, until we were getting quite a generous measure. Then, again impressing on us the need for secrecy, he departed as silently as he had come. There were only two possible explanations of this comedy. Either Authority, in the person of the village priest, had forbidden the villagers to sell us grain, or the Dotard had seized a moment when most of the villagers were away to sell us communal supplies and pocket the cash. We rather favoured the latter hypothesis. We did not give him any more rum, though he offered us the village for a bottle. We had no more to give.

A movement was now on foot to acquire some of our sterling Indian rupees. The normal currency was depreciated Chinese dollars. So the people brought us animal skins, and Cranbrook purchased a fine *chupa*, like a long, thick woollen dressing-gown with wide sleeves, and I a silver-lined wooden *tsamba* bowl. These bowls, turned on a hand-lathe, are made of walnut or maple wood, showing a beautiful grain. Every Tibetan possesses one, although only the well-to-do have them lined with silver. When the market was in full swing and everyone quite friendly the Dotard tried to induce us to exchange rupees for

Chinese dollars and Tibetan *tanka*. He offered us one Chinese half-dollar or three *tanka* for a rupee. We did not take it.

Jité has some foreign trade. All travellers from Burma, using the Namni pass, and Chinese traders and drug dealers coming from Ridong, rely on the village for supplies. The Tibetans no doubt make a good thing out of the simpletons from the Burma valley, but the Chinese are more than a match for them. All Tibetans are great travellers, and the Jité people visit the Mekong in Yunnan to buy salt, which they retail profitably.

It was a great relief when at last some of the yak returned from Kasaling and we were able to get fresh milk. Cranbrook had been seriously upset by something and had been living chiefly on tinned milk. I felt that fresh milk would make a difference to him.

We had been a fortnight at Jité when it came to our ears that an important Tibetan was at Ridong. At first he was represented to be an official of high repute; but the rumour was false, for the great man proved to be only our old friend the bulb digger who had so mysteriously stolen away. He wanted Indian rupees, but he would not come himself to Jité to get them. Oh, no. He heard that we were at Jité and had plenty of rupees: the villagers must bring him some. So the villagers, or most of them trooped off to Ridong to pay their tribute, leaving the corn standing in the fields. But they did not take many rupees with them.

By the 17th Cranbrook and I, both feeling a little sorry for ourselves, had had enough of Jité, so I entered into negotiations for transport back to Burma. This was

promised for the 20th. It was now Ba Kai's turn to be down with fever, and it was raining harder than ever.

While walking close to our camp one day, my attention was attracted by the extraordinary antics of some caterpillars, over a dozen of which were herded together on a twig. When I disturbed them, all with one accord, as though actuated by a spring, turned their tail-ends right over till they touched their heads. Thus looped, with only their legs bristling, the pattern resembled a flower or opening bud, anything rather than a cluster of scared larvae. I prodded one, and instantly it ejected with considerable force a jet of fluid from the anal orifice, the others following suit. Finally, still keeping their heads well down, they all started to wag their tail ends up and down until sheer exhaustion compelled them to stop. The contortion was disconcerting to some common enemy. There is no doubt that they were the larvae of a saw-fly. Many saw-fly larvae squirt liquid when touched, and some wag their heads, but tail-waggers were a novelty to me. At dusk, we were lucky enough to see a flying squirrel run up the trunk of a fir tree opposite our camp. We might not have recognized it as a flying squirrel had it not spread its sail and planed down the slope straight as an arrow into the darkness of the bushes, a distance of about sixty feet. The only other living mammal we saw was a striped squirrel. It appeared to be cracking cherry stones.

During our stay, we saw many birds with which we had grown familiar in the Adung valley, and some others: but not being able to collect any, we could not identify them. A babbler was certainly new to us; and every morning we heard crows cawing. But there were not so many birds as I should have expected to see in a region so well forested: the migrants probably go south by the Taron gorge and not over the high passes.

At last September came, and we prepared to depart.

CHAPTER XXII

THE MYSTERY OF THE IRRAWADDY

WHAT, then, of the course of the Irrawaddy? We had been to the source of the Tamai, which rises in the small glacier two miles beyond Lung Sa (although it might with equal justice be said to rise in the little group of snow-peaks, over 19,000 feet high, situated to the west) and which gives origin to the other of the two rivers which unite at Camp One. But the Tamai is not the main stream of the Irrawaddy: that honour belongs to the Taron. The Tamai is its principal tributary.

From the source of the Tamai we had crossed the mountains and reached a river which flowed to the Taron. Or was it the Taron itself? It is impossible to judge from its appearance the real size (i.e. the discharge in cubic feet per second) of a river, especially a mountain river of the speed and volume of the river below Jité. In comparing these streams, one is reduced to guessing or at best estimating.

At Jité, we were three days' march from Ridong, with two valleys between us and the Ridong river. The general direction of Ridong from Jité is almost due north, and the streams we would cross could only come from the north or north-west. Ridong itself straggles along the bank of a river — the Kalaw — which flows from the north-west. This river is the last of the Irrawaddy (or

Taron) headwaters. Directly above it towers a massive range of snow-mountains, with the Salween river beyond.

How big is this Ridong river? Apparently not very big; for the two white men who have reached it from the east describe it as a yard wide close to its source, and this in June, during the highwater season. Colonel F. M. Bailey crossed it in 1912 within a very few miles of its source; he then crossed a high mountain-range by the Tsong La and descended to another stream which flowed south-east to the Taron. That was the last he saw of the Irrawaddy. Continuing north-westwards up this stream he reached its source in the Zhasha La, crossed that pass, and was outside the Irrawaddy basin. From here he descended directly to a tributary of the Lohit river which flows to Assam. The Ridong stream, therefore, we know more or less by repute. But this second headwater — seen by Bailey—what about that? Had we gone on to Ridong, should we have crossed it? Could it be one or other of the two streams between Jité and Ridong? Possibly. But on the other hand it is more probably the Lokong stream, which as we have seen joins the Kasaling stream at Jité. It must be either one of these three or, finally, the Shori stream which we crossed just below Kasaling.

These six streams then, the Chuni, as the big stream which enters Kasaling is called, the Shori and Kokong streams which we crossed, two more streams between Jité and Ridong, and finally the Ridong stream itself, make up the Taron. One of these *must* be the source of the Taron. Now the Chuni, Shori, and Lokong streams are already combined by the time Jité is reached, and the result is a formidable river. It is very unlikely, though not impossible, that either of the streams between Jité and Ridong could be larger than this. There remains the Ridong stream itself. The source of this we know can be reached from Ridong in two days. But it would be quite impossible to reach the source of the Jité stream in two days from Jité, whichever branch is followed. That is to say, the Jité stream seems to be definitely larger than the Ridong stream, and the ultimate choice lies between the Lokong stream and the equally large stream from Kasaling, whether the Shori or Chuni branch.

Cranbrook and I did not in fact reach the source of any of these streams, for we descended from the high Namni pass by a tributary of the Chuni. But we put three streams on the map and thereby *perhaps* solved the problem of the actual source of the Irrawaddy, which I believe must be sought amongst these more westerly tributaries and not in the Ridong stream. My own impression is that the Lokong is the source of the Taron or Irrawaddy; and I place this approximately in Latitude 28°35″ N., Longitude 97°40″. E. M. Jaques Bacot, however, who crossed the Ridong stream in 1809, states categorically that *this* is the source of the Taron (Irrawaddy), which he places in a glacier he saw. Now it seems to me highly unlikely that the stream which rises on the Salween-Irrawaddy divide, the most easterly part of the river-basin, should be the main stream. It is more likely to be the Lokong or Shori stream, rising to the north-west of the Salween-Irrawaddy divide, where the highest peaks occur. But there is very little to choose. The possibilities are now, at any rate, so limited that it is a matter of academic interest only.

Coolies had been promised on September 20th and we did get away from Jité on that date, even though it was afternoon when we started. First we were informed that the coolies from another village, who ought to have arrived the previous evening, but did not, would come 'later' — a vague term. But when they did not come, even 'later', we were informed that they would not come at all: ponies and local coolies would be provided instead. Thus we finally started with two ponies and seven men to carry twelve loads and agreed to pay by the load at the same rate as on the outward journey. We had scarcely started before the men began to argue about their pay. Every half-mile a tall, saturnine man with long black locks, who came from Shori, would stop and in an aggrieved voice start the discussion all over again. He was quite good-tempered, really, but he wanted to be told once more how much he was getting, in order that he might indulge in an avaricious dream of buying the world. No wonder it was evening when we camped in a meadow below Kasaling, and no wonder we arrived tired, hungry, cold, wet, and bored.

We crossed the Shori river and reached Kasaling the next day. The big blue trumpet gentian (*G. Veitchiorum*), which I had not even noticed on the way down, was in flower all over the turf; but all the other flowers were over and the seed heads of the scented Cremanthodium perfumed the air. A few yak were still here, and we bought some milk and butter from the herds. As the ponies could not go any higher, and only one more coolie had arrived, it was evident that four coolies would have to carry eight loads. Soon after we reached Kasaling,

therefore, four men started off for the high camp with four loads, which they dumped under a rock. It was dark when they got back to camp.

Early next morning the clouds lifted for a minute, and we saw the mountain tops powdered with fresh snow. It soon began to rain again, and the higher we climbed the harder it rained. We reached our miserable camp amongst the rocks and fir trees early, and were able to put up the tent. When we had changed our clothes and drunk some hot tea, we felt much more able to face another transport strike, which was brewing. By that time the coolies were ready with fresh demands. I pointed out that they had now done three days' work. If they decided to down tools, as they threatened to do unless we agreed to an increase of wages, they would get no pay at all, whereas, if they went on one more day's march over the pass, they would at least get the guaranteed wage. No doubt a general strike near the pass would be awkward for us, because we were some distance from help on either side. But it would not do them any good either. They saw the force of that, and I struck, as they say, while the iron was hot. They must go on over the pass as arranged; and if we reached Lung Sa next day there would be a present for them over and above their pay.

That appealed to them: they were all smiles and good nature again, and there seemed every prospect of our getting back to Lung Sa. It was impossible to dislike these Jité folk: they were naive rascals. The ringleader was a pleasant-featured man with a slow, husky voice, as though he had plugged his throat with a wad of thermogene wool. He looked like a benevolent lama. There was a man who had been in the Lhasa army and was not quite certain whether it was an asset, and three elderly men like seedy churchwardens. Then there was an objectionable young man with a sycophantic grin, who was always loafing around us. You felt all the time that, like Russia, he wanted to make a separate peace. Meanwhile, rate-war or no rate-war, four of the coolies had gone back and brought up the loads they had dumped on the previous night.

The landscape had a wintry look already, and it was interesting to observe how the leaves of the evergreen rhododendrons reacted to the cold weather. All the previous year's leaves of *R. selense*, the alpine form, had turned yellow and were ready to fall; only the current year's leaves were green. The same was true of the dwarf alpine species *R. riparium* and *R. lepidotum*. So the leaves of these and other alpine species last only about eighteen months. The leaves of the alpine *R. Beesianum* last about two years, while *R. trichocladum* and its allies are deciduous, like azaleas. Below the alpine region, the leaves of most species of rhododendron stay on two or three years; nor do they turn orange and scarlet in the fall, as do those of alpine species.

The last thousand feet of the climb to the pass next day was an ordeal; especially did the snow-bed and scree exhaust us. There was a fresh layer of snow on the pass itself. It rained hard all the time, too, but this was nothing to the deluge which greeted us on the Burma side. Relaying the loads was an awful business, though the coolie leader promised to have bedding and food at Lung Sa that night. And he kept his promise. Four loads

had to be left behind in camp. And when we reached the pass, battered and breathless, four coolies dumped their loads under a rock and immediately started back for the camp to retrieve the abandoned loads. Cranbrook and I sat under a rock, waiting for them. Ba Kai and the coolie carrying the cook-box passed us at a trot. We let them get well ahead; and then, too chilled and hungry to wait any longer for the four coolies, who could not conceivably get back to the pass a second time under about three hours, we started down the Adung valley. We caught up the advance coolie all too quickly, but the nimble Ba Kai had raced ahead. I consoled myself with the thought that he would have a fire blazing for us and that the hut would be warm and snug, even if we had no food. We looked down the valley into a blank wall of mist. When we reached the bog we could see no welcoming cloud of smoke hanging over the camp. Perhaps Ba Kai has lit such a grand fire that it does not even smoke, I thought. We reached the camp and entered the big hut. It was cold, damp and unhygienic. It smelt of mould and had a horrible, unlived-in appearance, like a family vault. There was no fire. There was not even Ba Kai. We looked into his hut. Ba Kai lay on the ground, fast asleep. He had forgotten to bring any matches. With the help of some kerosene, Cranbrook and I soon lit a fire; but it was some time before the hut appeared habitable. We had no dry clothes to put on till the coolies came; but we huddled over the fire and made some tea and felt better. It was now six o'clock. Just after eight, when it was quite dark, the coolies arrived with our bedding and food.

The rain continued all night and all the next day. Soon after daylight the coolies left for the pass, where six loads had been dumped; they were back by one o'clock. I paid them their wages and rewarded them for good conduct and zealous service, so that they went off well contented, to cross the pass again before nightfall. The long marches undertaken by the coolies made our stages look too easy.

Now we set to work to unpack our boxes again, and make the hut more like a home. It was good to get proper meals again: porridge for breakfast, curried army ration, jam and biscuits. Before we crossed the pass our meals had seemed rather sketchy and monotonous, but now, after three weeks of even simpler living, our first dinner seemed a banquet. That evening we drank a half-bottle of 'simpkin' to celebrate our return.

I had brought over a number of live plants for my camp 'rock garden', chiefly lumps of turf containing the trumpet gentian and the blue-bubble gentian. I planted these out, and was pleased to find that all my collection, including primulas, gentians, and potentillas, had set seed.

We had rations for the three of us for about ten days. There was no news of Mano, nor of the Daru I had sent back to Tahawndam for help. Tsering might come to our assistance any day, and he might not. I had three weeks' work to do here, and I was loath to have to return to the village and then come all the way back again. Yet unless the Tahawndam people came up with rations it seemed as if that were what I should have to do. In this dilemma, Cranbrook volunteered to go down to the village and send up rations, joining me again afterwards.

September the 25th was so horrible a day that I urged him to wait twenty-four hours, but he insisted on starting and, I think, rather enjoyed the prospect of adventure and managing for himself. He started off gaily, carrying a full rucksack, which weighed about thirty-five pounds; while I remained to finish my work at Lung Sa. But no sooner had Cranbrook left than I missed him more than I should have thought possible. The camp seemed empty. Once more loneliness descended on me like a mephitic cloud. But it was good for both of us to part for a time, I knew; and with the hard physical work which lay immediately ahead I should get over my depression in a couple of days.

The first thing to do was to clear the hut for drying masses of seeds. The rain must stop soon, and in October there would be a fine spell. A few days of sunshine would suffice to ripen off the seeds of many plants. For the present, I confined my attention chiefly to the bog, and I was glad to see that *Gentiana Veitchiorum* was fairly abundant here. Gentians so frequently screw up their flowers when it rains that it was pleasant to find this one staying open in the worst weather. Some closed flowers which I placed in a tin and kept in the warm hut overnight had opened by morning. Evidently they opened and closed in response to a temperature stimulus and not as a direct response to sunshine and rain.

During the last days of September the weather began to improve, but I awoke on the last day of the month to see all the mountain tops again powdered with fresh snow. Winter was sharpening its claws on the granite mountains.

When I returned to camp on October 1st after a long day's climbing, I found three coolies arrived from Base Camp. They brought rice, corn and beans and a note from Cranbrook telling me of his safe arrival in the village on the fifth day. He had got hold of the headman immediately and made him send coolies to me; they had started the same day. This was a prompt piece of work—Cranbrook was always efficient. That very night the weather changed. The sky was cloudless and livid with stars. The temperature fell sharply.

The next day I sent the three Daru coolies down, but they had scarcely been gone an hour when a stalwart Kachin arrived bringing three months' mail from Fort Hertz. It needed some resolution to go up the mountain on the day's work before opening a single letter.

In October I settled down to hard climbing and collecting. My evenings were spent packing and cataloguing seeds. Amongst the seeds which had to be harvested here were gentians, saxifrages, asters, rhododendrons, geranium, *Gaultheria*, *Nomocharis*, aconites, *Omphalogramma*, *Meconopsis*, *Sorbus*, *Cyananthus*, *Swertia*, larkspurs, primulas, *Pedicularis*, *Viburnum*, *Vaccinium*, *Rubus*, *Cremanthodium*, and *Cotoneaster*: in all some sixty species. Had all the plants grown in one valley, the actual collecting might have been done in three days; as it was, since they ripened their fruits consecutively instead of simultaneously, I should still have had to wait here till the third week in October. Unfortunately they did not all grow in one valley. The sky-blue poppy, for example, grew in the West Hanging Valley, and *Primula Dickieana* only in the East Hanging Valley, on the north side. On the south

side of the same valley, a separate day's climb, grew *Gentiana Wardii*. Above the waterfall, down the main valley, were the only discovered plants of *Pyrus foliolosa*, the dwarf form; and up the main valley the only patch of *Meconopsis impedita*.

But the mere physical effort of visiting my plants, nestling in their ultimate alpine valleys at 14,000 feet in the Burmese alps, was not all. The beautiful sea-blue trumpet gentian, *G. filistyla*, for instance, presented its own problem. I had found dozens of flowers scattered over the turf ledges of the west valley, but two out of three capsules had been bitten off by pheasants, and the seeds were lost. I had to find another locality for it. I eventually found it at the top of the waterfall valley.

When at last the sun came out, *Gentiana gilvostriata* burst into heroic bloom on every bare earth slope which faced south, and the bog was carpeted with the sharp metallic-blue trumpets of *G. Veitchiorum*. But when would these plants ripen seed? Not for a month at least—not, perhaps, before the middle of November. Long before then, our alpine camp, Lung Sa itself and everything above 12,000 feet might be under snow.

In those hectic weeks of seed collecting at Lung Sa I learnt more about alpine seeds than I had ever known. Amongst other things I learnt that, for seeding purposes, alpine plants can be divided into three categories: (1) Those which ripen their fruits during the rainy season and whose seeds are sluiced out of their capsules, by the rain, before they are ripe or at least while they are yet green—e.g. *Primula chamaethauma*, and *P.*

vernicosa, whose seeds are never dry, but fall on to wet ground and remain wet; (2) Those which ripen their fruits in the fine autumn weather, whose seeds are blown or shaken out of their capsules by wind, falling on to dry ground — e.g. most of the alpine rhododendrons; (3) Those which ripen their fruits in winter, whose seeds are blown or shaken out onto, or even under, the snow — e.g. *R. repens*, which is often, and the late flowering gentians and *Cyananthus*, which are sometimes, seen flowering *in* the snow.

The last two categories overlap. The end of the monsoon varies in the Burmese alps, and the snow may come as early as September or as late as November. In an early year some of (2) may also be snowed under. In a late year most of (3) may bloom, ripen their seeds and scatter them before the snow comes. But the late-flowering gentians can be relied on to make trouble for the seed-collector. All alpine fruits, however, are not capsules (as botanists call the dry boxes, however unboxlike in shape, in which the seeds of lilies, rhododendrons, gentians and many other plants are contained): there are also berries, which are more like the popular idea of a 'fruit' — something rounded, fleshy and brightly coloured, if not edible. At Lung Sa there were *Viburnum* and *Sorbus* berries and the luscious softly violet blue berries of *Vaccinium modestum*.

But of all the berry-bearing plants none were more dramatically beautiful than the Gaultherias. Three dwarf creeping species were abundant. There was the common Gaultheria 9909, which grows indifferently on open gravel slopes or on beds of moss in the wisps of

forest which struggle like venerable locks out into the alpine region. This plant produces fat blue berries. The flowers are tiny, but in fruit the plant suddenly becomes visible, though the young leafy shoots, scarlet-tipped with fire, betray the plant as well as the cyanide-blue berries which cluster the thread-like stems. These berries slowly turn from purple to blue. Often seen growing with this Gaultheria, but only in the spongy mossbeds of the forest, is the remarkable G. 9885, even more inconspicuous in flower and leaf. But the flowers are followed in September by vivid vermilion berries, three times as big as the flowers. In the wet mossy beds, these pear-shaped berries, the only visible part of the plant, look like a trail of blood. This Gaultheria 9885 needs darkness as well as deluge and never comes out into the open. But sometimes it will curtain the mossy trunk of some forest tree with strings of red-hot beads. A third Gaultheria, like the others a mere wraith in the summer, has the largest berries of all. In late September a scree opposite our camp glistened with myriads of crystal hailstones, which neither melted nor rolled bouncing down the declivity, as one half expected them to do; for they were the fruits of the hitherto almost invisible network of Gaultheria. Sometimes these berries took on a rosy flush, looking like frosted glass bulbs, inside which a lamp had been lit. This plant and the azure-berried one often grew together on the open scree, just as the vermilion and the blue often grew together in the forest. But the vermilion and the white were never seen in company. They were the two extremes, the forest plant and the scree plant, and each kept strictly to is own terrain.

The alpine mat-plants, such as the two Gaultherias mentioned and the dwarf willows, do not die down in the autumn like the meadow flowers. Their leaves may turn yellow and begin to fall, but before they have disappeared snow descends and buries the plant for six months, fruits, seeds and all. When the snow melts in June, the mat with its dead leaves curled but intact, its buds ready to break open and sometimes with its seeds not yet scattered, is there unchanged.

Anxiously I watched *G. gilvostriata* and the big marsh trumpet gentian, wondering whether they would ripen any seed before I departed. No insects seemed to visit them, nor did the ovaries appear to swell. Every night the trumpets were frozen to the stiffness of thin crinkly paper, every morning they thawed.

During the first week of October I climbed to the top of the waterfall valley. I was standing on the 15,000 feet ridge, enjoying a wonderful view of Burma's snow range, fifteen miles away in the west, when a black cloud grew like a mushroom in the sky overhead. The sun disappeared, a great wind arose, and in ten minutes I was in the midst of a whirling snowstorm. Shortly before I had been lying full length on the alpine turf, picking gentian capsules. Now I could only cower under a rock and wait. The storm passed as suddenly as it had come, and an hour later the sun was shining brightly again.

One day I saw the most brilliant of all autumn colours that the alps display, *Euphorbia sikkimense*, its leaves luminous lip-red against incandescent gamboge with no intermediate shade. In the fir-forest was another gorgeous display, the dwarf *Viburnum cordifolium*, whose leaves had turned variously scarlet, wine-purple and canary-yellow; but in wet ground they were still apple-green.

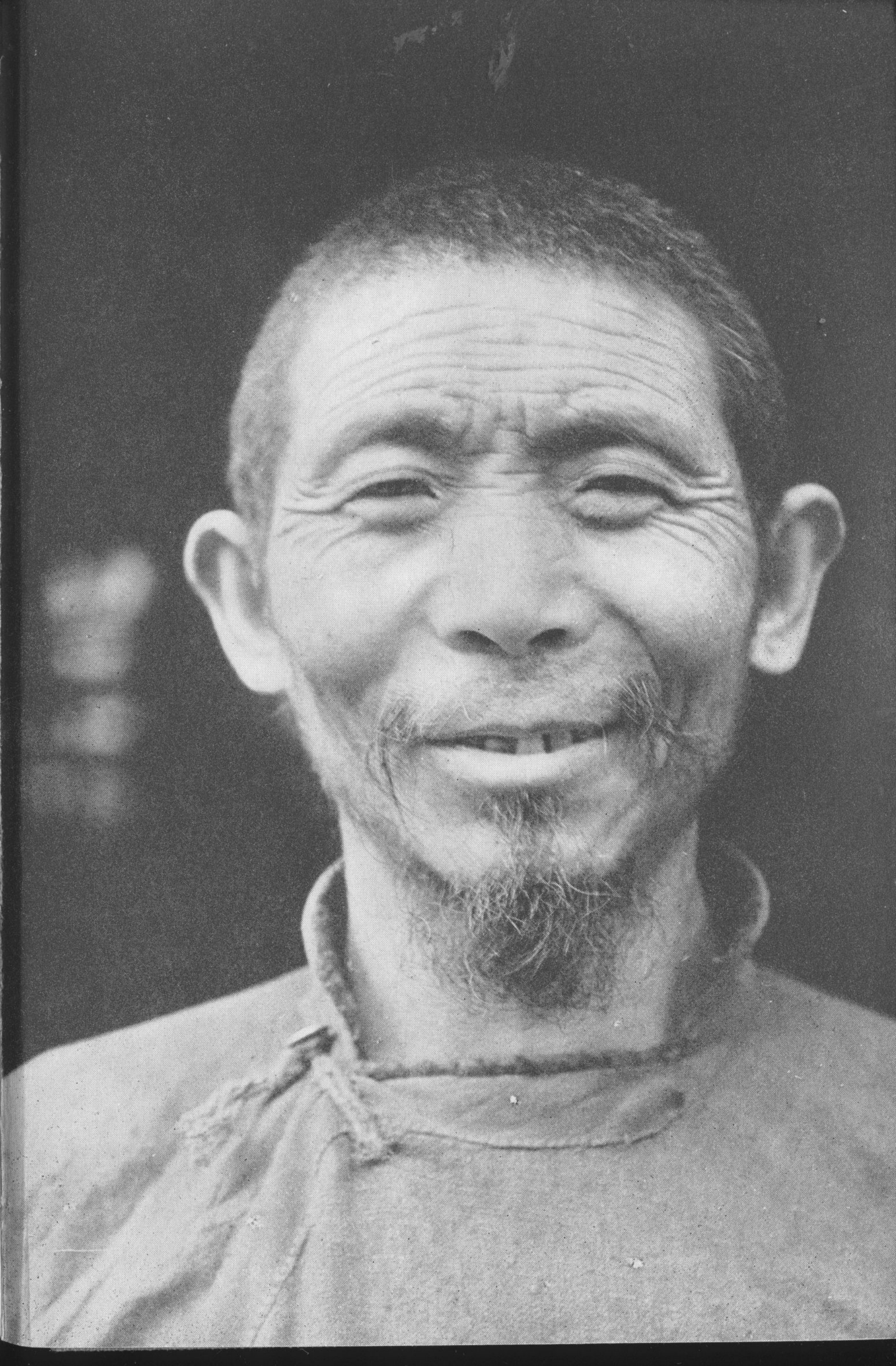
Although darkness descended on me rather suddenly in the evening and light came reluctantly at dawn, I enjoyed nearly twelve hours of daylight. This gave me time to reach the highest places where flowering plants grew. Even at 14,000 feet flowers still bloomed, for it was not cold. The soil was wonderfully warm, and along the edges of the snow-beds, June flowering plants, just uncovered, were coming into blossom. This was very conspicuous in the chilly East Hanging Valley, the upper portion of which was occupied by a large, permanent snow-bed, though there was not sufficient pressure to form glacier ice. The rich soil left by the recently melted snow was covered with a film of green from newly germinating seeds, and the soft yellow of *Primula melanodonta* lay like bars of pale sunlight across the dark gravel. Having been under the snow all the summer, these plants had had no chance to grow, but no sooner had the snow disappeared than up they sprang under the stimulus of sunlight. These would never ripen seed. But yet it was interesting to observe how all the normal processes went on, so long as certain conditions were fulfilled. Seeds germinated, herbaceous perennials grew up and flowered just as readily in the middle of October as in the middle of June. If the weather remained fine there was every prospect of my gentians seeding even so late as the middle of November.

I was now able to keep in constant communication with Cranbrook. Indeed the villages on either side of the range suddenly came to life. A succession of coolies came up from Tahawndam, and they always brought me something. I received supplies of beans, cucumbers, maize and hard peaches. Cranbrook was well and cheerful. He had been delayed by an attack of fever on the way down, but now, completely recovered, was living in Tsering's house. He confirmed the complete destruction of our hut by a rock avalanche, but, since we had removed our boxes to the headman's hut before the disaster, we had lost nothing.

As the coolies returned, I loaded them up with stuff no longer required, preparatory to evacuating Lung Sa. On October 14th three Tibetans from Jité appeared, bringing three half-bred yak for Tahawndam. The same evening came the lama, also from Tibet, where he had been spending the summer. Traffic over the formidable Namni pass became quite lively. With the lama was a scarecrow of a man, who led two fine Tibetan mastiffs. Next day yet another Tibetan arrived. Burma was being invaded. He had two indifferent mongrel dogs with him, and he sold me some butter, of which I was running short.

On the 16th a convoy of ten coolies arrived from Tahawndam, with a note from Cranbrook to say he was on his way up the valley, but would probably halt halfway between Camp One and Lung Sa, as he had hurt his foot. There was no news of Mano, he added.

By this time I had collected all the seeds I wanted from this camp, including rhododendrons. Only the two finest gentians were lacking, and they were still in flower. I pointed them out to Ba Kai and also to the lama, who so



[*facing:* THE LAMA OF TAHAWNDAM

far recognized them that he was glib with their names. Thus he distinguished the marsh-growing gentian by the name 'big Yulo Pong' and a violet, *Swertia*, as 'small Yulo Pong'. I impressed both on him and on Ba Kai the absolute necessity for seed of all Yulo Pongs. Then, after a whirlwind tour of the high valleys during the last three days, I finally evacuated Lung Sa on October 19th, just as the weather broke.

It was a dismal march down the valley in the drizzling rain. I left three loads of mat plants — entire sods containing gentians and similar treasure — at Lung Sa, because there were not enough coolies to carry them. They could go back for them. I went slowly, collecting seeds all the way, and it was late in the afternoon when we reached Cranbrook's camp. He had established himself on a terrace in the forest overlooking the river at an altitude of 10,000 feet. I was delighted to see him. After dinner we sat by a roaring log fire until midnight. The ruddy glow lit up the gnarled trunks of the trees and was reflected from the great silvery leaves of the rhododendrons. We had not seen each other for three weeks, so there was plenty to talk about.

Cranbrook told me how he had tramped down the valley in pouring rain; how the first afternoon he had crawled beneath a great rock; the difficulty he had had in lighting a fire, and how it had smoked evilly, almost driving him out of the cramped shelter; how he had continued the second day, but could not find a good place to sleep, and had woken on the third day with fever, which prevented him from marching; and how, on the fourth day, he was better and had gone on, till, on the fifth morning, he had reached Tahawndam, to the astonishment of the natives. He soon established himself in the headman's house and made known his requirements, chiefly by signs.

So we talked, and went to bed soon after midnight.

CHAPTER XXIII

A PRIZE FOR ENGLISH GARDENERS

We did not get away from our forest camp as quickly as we had expected. Another period of immobility lay before us. We had not enough food to feed all our coolies for more than a few days, so we employed them on relay work. Three went up to Lung Sa to bring down the baskets of plants, and these got back on the following day. Two went quickly down to the village to enlist more coolies, and five set out slowly for the village carrying loads we no longer needed. After that we — that is, Cranbrook, Ba Kai and I — were marooned for eight days. It turned wet again, and, expecting fine weather, we had used the outer flies of our tents for packing purposes. Consequently our tents leaked. As for the birch-bark shelters, Ba Kai's was flooded out, and he sought refuge in ours for cooking and sleeping, though it was not much of an improvement.

An unexpected visitor from Jité, halting on his way to Tahawndam, informed us that snow was falling at Lung Sa; so good-bye to *Gentiana gilvostriata*, I thought. This was a terrible disappointment when it was almost within my grasp. I was very proud of *Gentiana gilvostriata* when I first saw it in the Seinghku valley in 1926. It happened to be a very wet year, and before I could get seed of the plant it was buried under the snow. The autumn of 1928 was even worse. I was in the Mishmi

Hills, and again I found the gentian in flower but not in fruit. Still no seeds. Yet here was *Gentiana gilvostriata* giving me a third chance. If I failed this time, never would I deserve to see it again. But what a hope I had.

I climbed the screes and gullies round our camp. Genuine alpine plants will under certain conditions descend far below the tree-line; for, in a narrow gully of the kind that is periodically swept bare by snow avalanches and regularly sluiced with water, I found *Primula Dickieana*, *Diapensia himalayica*, *Omphalogramma Souliei*, *Cassiope* and dwarf willow plastered over the steep rock sides as though this region were 14,000 feet instead of only 10,000 feet. But the most remarkable example of the lag produced by a snow covering was a narrow-leafed, June-flowering iris which had been buried alive and was flowering perfectly alongside the snowdrift whence it had recently escaped into the sunshine. Its whole rhythm had been upset, and it had no chance of ripening seed. Yet there it was, flowering boldly in the teeth of winter. On the screes, *Aster fuscescens* was in bloom, and here I collected seed of the fine form of *Nomocharis pardanthina*. No less than fifteen species of rhododendrons occurred, lining the sides of the scree. Amongst them were a few plants of *Enkianthus pauciflorus*, with solitary cherry-red flowers hanging stiffly from the leaf axils. The much commoner *E. himalaicus* grows in shadier situations. None of the shrubs were in flower, of course, except that the winter buds of several rhododendrons, notably *R. selense*, *R. riparium* and *R. crebreflorum*, stimulated by the recent fine weather, were opening prematurely.

The mat plants, such as gentians, creeping willows and primulas, which I had brought down from my rock garden at Lung Sa, were now unpacked from their baskets and set out on a fallen tree-trunk near my tent to ripen their seeds. During the night, mice and voles descended on them like a cloud of locusts and devoured nearly all the gentian capsules. It was a frightful loss. After that I built a Wotan ring of traps around the sacred enclosure; but the only effect of that was to drive the herd into the alpine tent where I was trying to dry seeds on the ground with the help of a small Beatrice stove, and there were more casualties.

The rain continued, and our forest camp became a quagmire. Supplies of fresh food were running short. We were just sitting down to tea on October 28th when we heard voices outside, and two Tahawndam men walked in and squatted on their haunches in the doorway sucking their bamboo pipes. They brought us another mail from Fort Hertz.

We decided to start down the following day, using these two coolies and leaving Ba Kai alone in charge of the camp till we could relieve him. So we packed hastily, and at noon next day we were off. Naturally we could not carry very much, though we loaded heavy rucksacks ourselves. We were restricted to bare necessities — a few blankets and cooking pots and some food. Nor had we more than four miles to go, for I wanted to halt at Camp One to collect primula seed.

I was so busy collecting seeds on the road that I did not arrive in camp till just before dark. About half a mile from the hut I had to leave the path and turn up a side valley to search for the rhizomatous iris which I had seen in the spring. There was not much of it, but what there was had flowered, and I found one or two capsules containing a few small, globular, coffee-coloured seeds, unlike those of any other iris I knew. I speculated — unprofitably, no doubt — on what the flowers were like, for forest irises of this type are not common, and the narrow but ample grass-like foliage resembled that of *I. unguicularis*. It grows in marshy places along the banks of streams where willows grow, but I did not see a dozen plants in all. The flowers open late, probably in July. Seeds sent home germinated, and I know of three healthy plants in a Sussex garden, but up to the time of going to press they have not flowered. When they do, it will recall for me that late October evening when, after five hours' marching, I unslung my heavy rucksack, set it down on the path and scrambled up the gully to hunt for an elusive iris which I had never seen in flower.

Luckily for us the rainy spell was over; the weather had turned fine again and colder. By the time I reached the river confluence, Cranbrook had lit a fire in the old cookhouse, finding this healthier and easier to warm than our hut, which leaked and smelt mouldy. Cranbrook cooked our supper, and once in bed we were warm and comfortable.

Next day we sent the coolies back to Ba Kai for more loads, determined to make ourselves as independent as possible. They had hardly started up the valley when two more coolies arrived from Tahawndam on their lawful occasions. They were going to meet and take possession of a cow which was being brought over from Jité.

It was more spring-like than autumnal at 8000 feet; there were no rhododendrons in flower, but neither was there any autumn colour.

Climbing down the valley we had enjoyed the brilliant tints of maple and birch and barberry, but so far there was nothing like that here. Now, looking up at the cliffs, we saw a sharp line where the autumnal colouring began; it corresponded roughly with the lower horizon of the rhododendron sea in June. When the coolies had gone I tramped off down the valley to collect seed of *Primula sino-Listeri*, the plant which had caused me so much heartburning in the spring. Of this, too, I found a fair amount.

We hoped that coolies would arrive from Tahawndam, but none came all day, nor did the men who had gone up to Ba Kai return. We cooked our own food as before. We agreed that it would be best to return to the village and infuse a little life into the dilatory headman ourselves. Early next morning our first two coolies arrived from the upper camp, and we found ourselves with four loads and only two coolies. Providentially, while we were packing, the other two coolies arrived, conducting the cow. We told them to jettison the cow and carry our loads: which they did after tying up the cow where it could graze. We gave them all a good breakfast of rice, not forgetting the cow, and started down the valley once more, carrying everything, but abandoning Ba Kai. At the last minute the men decided to take the cow too, though they had not merely to lead it, but over the most difficult places to carry it. Luckily we set ourselves to do only a very short march, as I wanted to collect seeds of various plants on a certain flat sandy place, where the river widened and for a quarter of a mile flowed peacefully.

When we had descended another thousand feet we found clematis flowering joyously in a green forest. It had dainty thumble-shaped flowers, creamy white in colour. We camped at the foot of a mighty tree, and having no tent we built a big fire. The sky was spangled with brilliant stars, and Cranbrook cooked an excellent dinner. Just as I dropped off to sleep I saw a piebald mound by the fire; it was the cow, resting its chin on one of the warm stones. In the middle of the night I began to have a most awful nightmare. I struggled vainly for some time and at last awoke, half-smothered, to find an intolerable weight pressing on me. It was the cow. Feeling cold it had snuggled closer and closer to me; then, finding my blankets softer than the earth, it had gradually settled itself on the bed, till it threatened to overlay me. Already it was half on top of me. I shooed it away and presently fell asleep again.

Even the cow kept ahead of me next day, so heavily engaged was I in seed-collecting. At one point the path ended on the river bank, and it was necessary to wade across to an island, traverse it and then return to the mainland farther down-stream. As there was nothing to indicate the ford, and to miss it might mean drowning, I was not too happy when I plunged waist deep into the icy water, which was running fast. But I struggled across safely. The path continued up and down, and I remembered that the cave we were bound for was some distance off the path; I didn't know exactly where. It was getting late, and climbing up and down cliffs by inadequate

ladders, wading through icy water, and pushing through rank, tick-ridden undergrowth had much numbed my senses. I was dead tired. Towards dusk I was still plugging along the abominable path far behind everyone, when, just after passing the embers of a suspiciously new camp fire, I came on a bamboo stuck in the middle of the path and impaling a piece of paper on which was an arrow pointing to a faint track up the slope. It was a message from Cranbrook. Following the route indicated, I climbed the steep, forested slope and almost immediately heard the sound of voices. Suddenly I arrived at the edge of a small terrace, and there in front of me was the most colossal block of stone I have ever seen. It looked as big as the dome of St. Paul's Cathedral; an infantry platoon could have camped snugly beneath its generously overhanging slope.

Our four coolies were sitting round a fire in one corner. Cranbrook was lying on his bed in the enclosure reserved for us. But it was not the sight of this magnificent stone mansion, nor of the coolies, nor of Cranbrook sublimely comfortable, nor even of the welcome fire which astonished me, but the sight of Mano preparing my bed and cooking our dinner. After all the little vexations and irritations of a long march, that was a welcome sight. I was so delighted to see him that I forgot for a moment that he had overstayed his leave by a month. In fact we had completely given him up and never expected to see him again. At dinner Cranbrook told me how he was going along the path when he heard someone ahead break into cheerful song, as no gloomy Daru ever did. He wondered who it might be and, turning the corner, came upon

Mano warming himself by a fire. He had left Tahawndam early that morning, having heard that we were on our way down. Mano's story was very much what I expected. It had taken him twenty-five days to reach Fort Hertz from Lung Sa during the height of the rainy season, and he had decided to remain there until the rains slackened, with the result that he caught a fever which still further delayed him. Altogether he had been away more than nine weeks.

I found that there were more coolies gathered under the stone than our four. Tsering had at last sent help. Next morning six coolies went up to bring loads down from Ba Kai's camp, while six accompanied us. We were over the worst of the ground, and it was pleasant in the forest where the undergrowth was dying chromatically, though most of the trees were green. Conspicuous along the river bank was *Tetracentron*, an ornamental tree like a *Cercidiphyllum*, whose leaves were turning sherry-brown. When we reached the mouth of the gorge, it was necessary to go carefully along the narrow path which climbs up the cliff. While collecting seeds I stepped too near the edge, and it gave way, precipitating me over the cliff. A tree saved me from falling into the river.

The gorge ends, and the valley widens suddenly round the corner, where cultivation begins. It was something of a relief to emerge from the dark oppression of the forest into light, airy fields once more and to see huts. The villagers were threshing corn, and the wooden flails rose and fell rhythmically, to snatches of song. Where our Base Camp had stood six months ago was now a devastated area. A wide river of rocks and mud, twenty feet deep and still moving gently, like plastic lava, had poured over the site; and the course of a stream had been changed. It all happened one dark night in August after torrential rain. High up on the mountain face, a gully had been choked by a small slip, and behind the dam a lake formed. The dam burst, and a mud river came down in an avalanche. The terrified villagers had wakened to hear the moving cliff grinding down the gully, gathering speed as it came, the sound of it growing louder and louder as it rolled on its path of destruction. It was touch and go whether it overwhelmed and buried the village; luckily, though the mud had flowed within a few yards of the nearest house, it had then stopped. But there was no more sleep for the trembling villagers that night. Had we been at Base Camp we must have been engulfed, for the flood came in the dead of night, without warning, and the noise of the storm and the roaring of the river alongside us would have drowned all other sounds. Tsering had built a grass hut for us on the river bank, half a mile away. We found it snug and warm, but not waterproof. He brought us buttered tea and *tsamba*. We got our boxes from his house and settled in, with Mano to cook for us and the local inhabitants ready to help in any way we wanted. The storm which had been threatening broke, and for three days grey sky drizzled steadily. But at least we could feed well, and, after the last ten days, that was something. On November 2nd we had an excellent breakfast of porridge, fried sausages and rice with sweet potatoes, and an even grander dinner of pemmican soup, roast blood pheasant, with boiled *dhal* and pumpkin, finishing up with Christmas pudding. In the middle of the day we celebrated everything there was to celebrate with two half-bottles of 'simpkin', and such unaccustomed cheer almost unnerved us. For the time being, at any rate, food had assumed enormous importance.

November 5th was a really glorious day. The cold weather had begun at last. Meanwhile, the snow had crept down to 10,000 feet. If the fine weather continued, it would melt; if not, then the fate of *Gentiana gilvostriata* was finally and hermetically sealed.

The berrying shrubs were a brave sight, notably the yellow and scarlet *Celastrus Loesnoerii* and *Vaccinium gaultheriifolium*, with bunches of violet grapes hanging from the ends of the branches. Conspicuous in flower were a twining violet-flowered gentian and *Schima*, with large cream-coloured, camellia-like flowers. I went about collecting seeds of rhododendrons and other desirable garden plants, climbed the cliffs to get the holly-leafed *Berberis insignis* and *Iris Wattii*, and then turned my attention to the carmine cherry. It was bare of leaves and not easy to recognize, for there was not a cherry to be seen on it. At last I found a big tree and turning over the leaf mould beneath unearthed a few split stones. Birds or squirrels had been eating the fruits. Eventually I picked up two or three cherry stones and then set all the village children to work searching carefully. The first rewards — for I paid by results — brought more searchers, and eventually I had a dozen people looking for buried treasure. The difficulty was to find trees for them. At the end of ten days, we had amassed about two hundred cherry stones, most of which cracked between my fingers

when the gentlest pressure was applied. They were empty. Only about ten per cent of the seeds were viable, and I sent these to England. Some half-dozen germinated; I know of two trees in a Sussex garden, growing in the open, the largest, now in its seventh year, about eighteen feet high. It has not yet flowered. When it does, people will go on pilgrimage to see it.

For three days after our return to Tahawndam it was impossible to dry any seeds. It rained steadily; there was no sun; and our hut leaked. But after November 8th I had no difficulty; the work went on. Meanwhile I was enlisting coolies to go and bring down the last few loads, and Ba Kai. He arrived on the 9th, the same day that I climbed the hateful mountain for the pink rock-rhododendron, as already recorded.

On the 12th I sent Ba Kai back to Lung Sa to make good his boast that he could recognize *Gentiana gilvostriata* and the trumpet gentian (*G. Veitchiorum*). He was to collect seed of both and not dare ever to show his face again if he returned without the former. I sent two Darus with him to carry his bedding and food and told them to go quickly. He returned on the 16th, having been absent just four days. At first I couldn't believe he had been to Lung Sa, so fast was his time for the course; but there was seed of both gentians, which helped us to believe his statement that our alpine camp was under snow. The steep south faces, he said, where *Gentiana gilvostriata* grew, were uncovered, and he had found plenty of seed. So I was at last able to introduce this lovely gentian to English gardens. It is now well established all over the country, wherever rock-plants are grown.

Our Tibetan friends brought us food every day and surprised us with the variety of their diet: chupatties as large and solid as cartwheels made of millet and buckwheat, maize-meal, barley meal, and sausages spiced with a curiously pungent sauce. They also brought us eggs, peaches, pumpkins, beans and lentils. But the *specialité de la maison* was miniature maize-meal dumplings, fried in butter and eaten with wild honey. Milk was now plentiful, though it had a tendency to curdle when boiled.

On November 15th we went up to our 'week-end cottage'. Before starting we packed everything, so that on our return to the village we could immediately leave for Fort Hertz. The last few days had been hectic: the local inhabitants seemed suddenly to realize that we were about to depart from them and, in their way, regretted it. Children brought me bunches of flowers and offered to collect seeds of anything I wanted. An attempt to get more seed of the pink cliff rhododendron proved abortive.

We fixed our final departure for November 20th and went off for a week-end in the country. Arrived on the shoulder, we pitched our tents and lit fires, for it was much colder here than at Base Camp. The view across the valley was wonderful, but there was a certain lack of colour, as if it had all faded out with the falling temperature. It was a tensely still moonlight night. We dined in the open by a blazing fire, and our pink-shaded candles cast a soft and civilized light over the white tablecloth. The wind which had whistled keenly over the brae at sunset died away before nightfall, and the Adung river throbbed faintly, like a deep artery.

A slight ground-frost crisped the grass at dawn, but it quickly melted. After breakfast I followed the cattle-path up the mountain, first crossing the russet-coloured slope to where a clump of scarlet-leafed trees stood fiery against the deep blue sky; beyond that, honey-gold larches shone as they were struck by the low rays of the sun, grazing the rim of the mountain. The path through the forest was steep, but well-defined. I passed through the whole gamut of rhododendrons, which appeared in three belts in this order: First, *R. vesiculiferum*, *R. trichoeladum*, *R. heliolepis*, *R. neriiflorum*, *R. niphargum* and *R. hylaeum*. Then, above 10,000 feet, mostly smaller shrubs: *R. pruniflorum*, *R. arizelum* (a tree), *R. crinigerum*, *R. megeratum*, *R. eclecteum* and a species I had never seen before, related to the last. The topmost belt, which began at 11,000 feet, consisted almost entirely of *R. selense*, *R. riparium*, *R. lepidotum* and *R. crebreflorum*. At this point the silver fir forest began. Snow lay deep under the trees, and the dead silence of the long winter which had set in was most impressive. Higher up, the fang-like pinnacles of rocks were cold and bare.

On the following day I went down the spur. Along the edge of the forest, a small-flowered aster was breaking into clouds of starry clusters. A single corymb will bear as many as thirty heads, with mauve, purple, or white ray and yellow disk. Within the forest I found a giant clematis in brazen bloom, looped from the mast-head of a big tree. It has entire leaves, which is unusual in a clematis. There were some big bushes of *Berberis Hookeri* on the ridge, one with a trunk like a hawthorn. The prickly leaves turn vivid scarlet in winter.

On November 18th Cranbrook and I, returning to camp from a climb, found a *pyada* waiting for us with news from Fort Hertz. I felt that the expedition was already over. Nothing remained but to pack up, return to the village and take the road south. Our last morning at the week-end cottage was fine and sunny. It seemed a pity to go, and we went down sadly. That night we had a grand farewell dinner, though there were no guests to entertain. When we turned in, the camp had a dismantled appearance, like a house to let. But I left most of the packing till the morning.

CHAPTER XXIV

JOURNEY'S END

Southward Ho! That was all my thought when I awoke on November 20th and looked round the bare hut. There was no time for silent meditation: the turmoil of getting away had begun. By the time we had finished breakfast, all the inhabitants of the valley, Darus and Tibetans, had arrived, some to carry loads, some to see us off, some just to see us. The bazaar was open. Women took off their rings and bangles for sale. We gave presents to all the important people, and they in return brought us lumps of butter, meal cakes, pumpkins and honey, so that we had to engage another coolie at the eleventh hour to carry the local supplies. I took photographs of the local beauties while they were in festive mood. To a chorus of farewells and a promise from Tsering and 'George' that they would meet us at Myitkyina, we left Tahawndam, crossed the Adung river by the swinging cane-bridge for the last time and tramped down the valley.

The little Daru headman of Adung Long met us and brought us a present of a fowl and some yams. These yams are the tubers of a species of *Dioscorea*, a sub-tropical genus of perennial plants, with annual twining stems. In the Adung valley they are found deep in the earth, on the bracken-clad slopes where the forest has been cleared. There were excavations at Adung Long which might have been made by badgers. When the crops fail, the miserable Darus live on yams. I found them also eating the big acorns of an oak (*Quercus lamellosa*) and the purple pulpy sausage-fruits of *Akebia*. Next day, as the result of excessive celebrations, I was feeling ill, and by the fourth day when we reached the hut at the Seinghku confluence, where the bridle path begins, Cranbrook was down with fever. So we rested a day and ate our fowl, the first we had had for six months.

It was with a sigh of relief that we at last emerged on the cultivated terrace between the two rivers and thence on to a broad path. After struggling along for weeks, tripping and stumbling, clutching wildly at creepers which gave way or at branches which scratched and pricked, to walk upright like a man seemed wonderful. When we reached the bamboo hut, where the rivers unite to form the Tamai, we felt that life could hold no greater comfort or relief. True it was not a very wonderful hut. We had built one almost as good, though less chill-proof, above Tahawndam; but there was something more permanent about this one, as though man had made good his footing in the jungle here. And he had. The Tibetan family had survived the rains. They brought us milk and eggs and a gargantuan lump of butter.

The smiling Anu had come down from Haita to greet us, and he, too, added his quota to the larder, which was increasing faster than we could check it with our impaired appetites. We gave him an axe, for which we had no further use, and he seemed delirious with joy. Anu told me that during the rains a party of Lisus from China had come up the Tamai into the Seinghku, to collect *pai mu*,

and had maltreated the inhabitants. Further, the Rima authorities were demanding payment of taxes or, alternatively, his immediate return to Tibetan territory. Harassed from two directions he did not know what to do: he begged me to lay his case before the Burma Government. Then he showed me his appointment order as headman of Haita and the adjacent villages, carefully rolled up inside a hollow bamboo. He produced other government documents. Here I read: 'No person from China or Tibet is permitted to remove medicinal herbs or to hunt musk deer in British territory, without the permission of the headman of the area.' This was dated 16.1.1928, and signed by a British officer. I knew that Anu would give no such permission in the Seinghku valley except under severe pressure. Another scroll said: 'The inhabitants of (here followed three villages) reside in British territory. They pay revenue to the British Government and have elected to become British subjects. Anyone interfering with them or coercing them in any way contrary to British law will be severely dealt with.' An idle threat! These people are interfered with and coerced every year, and no one is severely dealt with. The British Indian Government knows nothing about it and could not do anything if it did. I may say that these appointment orders and warnings were written in English; but, had they been written in Chinese and Tibetan as well, the sholarship would have been wasted, for the bandits of the upper Irrawaddy are not men who can read or write.

When one contemplates the considerable sums which have been spent by the Survey Department in accurately mapping a great deal of the upper Irrawaddy, one may well ask, 'To what purpose?' Chinese and Tibetan bandits have no maps, but they know where to look for *pai mu* and musk and how to reach the Irrawaddy. If the local government cannot protect the loyal population of so-called administered territory like the Seinghku valley, then God help the people of unadministered territory, such as the Adung valley. Doubtless the total population of the area north of the Seinghku confluence, that is the Seinghku and Adung valleys, does not amount to five hundred souls. It is a hard land, nor can men easily wring a living from it. They become hard, too, and ruthless. But the remnant of the Darus have very little chance to become either hard or ruthless.

We were now back in the valley where no winter comes, and during the six days' march to Pangnamdim we saw many flowers. The beautiful *Luculia gratissima*, a shrub with bunches of large rose-pink flowers, which blooms throughout the winter, was abundant on the cliffs. It has every virtue a flowering shrub can have except hardiness. A purple-flowered twining gentian was also common in the high grassland. More and more tropical trees appeared. As the third day's march was a long one, I told Mano to call us early, but I was not too pleased to be awakened in the dark and to find on looking at my watch that it was 3.30 a.m. I fell asleep again, after telling Mano to go and boil his head, and was up by 6.30. We had a cup of tea at 7, and were on the road by 9. We began to meet travellers on the road, a Chinese pedlar, his goods carried by a Daru coolie, a Hkanung visiting a friend in the next village, and finally a hunter who was going after a deer he had wounded some days previously and lost. He had set up a sign consisting of a cross-bar in a slit bamboo flanked by two upright bamboos, which denoted that the animal was wounded and had gone into the jungle and was anybody's for the catching. The symbol still stood, an indication that nobody had taken advantage of the invitation. Such sign language is common among the tribes.

For instance, when there is an epidemic in a village, the fact will be notified by symbols placed on all the paths leading to the village. If a man cuts a pile of wood in the jungle, he will leave a symbol to indicate that it is his private store. Such property is respected in the jungle. A man who would not scruple to steal money from his brother sleeping in the same hut with him would not dare to steal a bag of food hung up in a cave miles from anywhere. Food is sacred.

As usual, many of our loads were carried by women and girls, some of whom, but not many, were tattooed. Everybody smoked a pipe, either a Chinese metal-bowled pipe, or a piece of bamboo fitted with a stem, or occasionally a hollowed-out bamboo root. The tobacco is just dry powder and is carried in a bag. The pipe has to be filled inside the bag, otherwise most of the powder would be lost. It is lighted by another smoker tipping a few red-hot ashes from his bowl into his neighbour's. Girls either smoked or chewed betel.

It would be difficult to say whether bamboo or cane is the more useful in the jungle. The former is the more extensively used, being the principal building material, but cane is indispensable for bridges. Sometimes one saw bamboo put to the most surprising uses — for instance, as swords, used for slashing a way through dense secondary growth. These lath weapons were about three feet long, quite straight, split from the largest bamboo. The edge was as hard as iron, and quite sharp enough for the purpose. Iron is used very little. The Hkanungs are reputed to make the best knives of any jungle tribe, and most of those used by the Shans are made by Hkanungs. Their cross-bow arrows are iron-tipped, and they also make unbarbed harpoon hooks. Had there been valuable mineral deposits in the upper Irrawaddy basin, it is certain that the country would have been opened up by the Chinese long before this. Its very uselessness has kept it undefiled.

On November 29th we were only one march from Panglamdim, where the bridle-path to Fort Hertz leaves the Tamai valley. It was exactly a year since we had left Myitkyina, so we held another celebration. Ba Kai prepared a magnificent repast, *hors d'œuvres* (a sardine with vinegar saved from a bottle of olives), tinned soup, rice with yams, an apple pudding, this time boiled in a clean handkerchief, and a jam omelet. The eggs were not very fresh, so we had to use nearly a whole tin of jam to conceal the horrible truth. But, by that time, we had drunk a half-bottle of 'simpkin', and the whole world, omelets and all, was pleasant.

On the following day, we reached Pangnamdim and the big cane-bridge over the Tamai. Here we found messengers from Fort Hertz waiting for us with our mail, so at last we heard all the astonishing news which had been piling up since August. Somehow, at that distance of

space and time, it did not sound so catastrophic, even though we got it in concentrated form. Crossing the Tamai we climbed the 4000 feet to the top of the limestone ridge and sat down to look our last on the high mountains and drink our last bottle of 'simpkin'. I noted *Manglietia Caveana*, a fair-sized tree. It was in flower, but out of reach, I had long wanted a specimen, so I shot down a branch. Cranbrook, who heard the shot, thought I was shooting a squirrel, at least, and was bitterly disappointed when I triumphantly displayed my twig of *Manglietia*. I had picked up the short dumpy fruit of this tree five years previously, but in the absence of flowers or even leaves, it was impossible to be certain of the identification. Now I had secured incontrovertible evidence of the common occurrence of this Assam *Manglietia* on the upper Irrawaddy.

That night a tearing wind arose, and, the hut being placed in an exposed position, we caught it squarely. It was still blowing half a gale when we woke up, but the sky was gloriously clear. We had none of that early morning mist which had swamped us — body and spirit — in the Tamai valley.

So we said good-bye to the eastern Irrawaddy, and plunged down into the hill jungle of the lower-lying valleys of the west.

On December 4th we reached the Tisang river, where I expected to meet a mule convoy which was being sent out to us from Fort Hertz. The mules, however, had not yet arrived, and as we had been marching for ten consecutive days we were glad to rest for a day. Also, we had no flour to make chupatties, and we took the opportunity to have some rice pounded by the brawny Hkanung wenches of Nogmung. With this we made rice cakes. Fowls, eggs and fish were procurable once more. We bought a bunch of bananas, and though semi-wild, slightly astringent, and full of black seeds they were edible. The person who habitually eats seedless Jamaica bananas, ripened on the voyage, has little idea of what a wild banana really looks or tastes like.

The headman was building a new house, and I watched half a dozen men hoisting the huge central pillar in position by means of a bamboo sheerlegs and ropes made of creepers. The erection of this, always the first part of a house to be put in position, was accompanied by singing and cheering. The next three marches, over the last high range before the plain of Hkamti Long is reached, were important ones for me. Near the summit grew the slipper-orchid since named *Cypredepium* (*Paphiopedilum*) *Wardii*. I engaged a coolie to carry a large empty basket. Crossing the range on December 7th, I found the orchid in quantity, mostly in bud, and dug up about a hundred plants. December 9th saw us toiling up through heavy forest to the last ridge. It was the quick of the morning, and we reached the top early enough to look down on to the Hkamti plain, 3000 feet below, before the heavy mist became volatile. The long spurs of the mountains flared out into the white sea, which was beginning to heave and roll. Presently it came smoking up, and the sun split it with broad wedges of light. The tree-trunks alternately appeared and vanished, as the mist passed. We went down to the edge of the plain and slept in the comfortable hut at Kankiu where we had spent such a

disturbed night almost a year ago. The setting sun shone redly on the placid and broad waters of the western Irrawaddy.

The following day we walked the fifteen miles to Fort Hertz, across the sunlit plain. As we approached the village, we saw the fields honey-gold with the winter paddy. A year, all but fifteen days, had passed since we last saw the rice-fields of Burma. Mr. J. T. O. Barnard, an old friend of mine who was revisiting Burma, met us; Leedham, from whom we had parted on the Tamai eleven months ago, was also in residence. For the next few days I was fully occupied in packing and dispatching by post the orchids I had just collected; also in drying, packing and writing relevant notes on the three hundred species of seeds I was sending home. This very necessary delay made it certain that we should not reach the higher civilization in time to join in the Christmas festivities, an orgy we were anxious to avoid. An unaccustomed mode of life is best approached cautiously, or the impact is likely to detonate all the higher explosive ingredients of human nature. We decided to spend a quiet Christmas by ourselves on the road.

The Hkanungs are adepts at making traps both for birds and mammals. For the larger beasts, a simple deadfall is used; but a more ingenious type operates a horizontal spear which impales the animal. It is in the smaller types, however, for catching jungle rats, that the Hkanungs reveal the most unexpected talent for simple machinery. We saw a selection of their work. All the traps are made of bamboo, and work on the principle of a trigger releasing a spring, which a bent bamboo furnishes, the victim being caught in a noose. In the most cunning of them the animal gnaws through a string soaked in brine. A piece of rock salt is often used as a bait, and effective it proves in this acid land.

When we left Fort Hertz on December 16th a storm was brewing, and by evening the whole sky was overcast. Yet not much rain fell during the march south until Christmas Eve. On Christmas Day it poured with rain while we were having breakfast, and we started in low spirits, to the accompaniment of a chilly breeze. Mile after mile we paddled on through the sticky mud in silence, and soon I fell behind. Some days previously, I had spilt some boiling water over my foot, and it was not yet healed. As I turned the corner to the hundredth mile-post from Myitkyina, I found Cranbrook in conversation with a white man. It proved to be Captain Gamble, of the Military Police, on his way to Fort Hertz. We were about half-way between bungalows, so we persuaded Gamble to turn round and accompany us on the five miles to Kawapang, whence he had started that morning.

We spent the afternoon exchanging news and luxuries in fraternal feelings. But they did not quite embrace all the Kachins who turned up to see us. The weather improved, and towards evening we went out on to a neighbouring hilltop to watch one of those vivid sunsets you sometimes see in the hills. The bungalow was perched on a knoll which rose like a coral island from a bottomless sea of cloud, and all round us the coast ranges were washed by breaking waves, ruddy in the glow of the setting sun.

Although our mince pies and Christmas puddings had long since been eaten, we were not at a loss for a banquet. We managed to buy a brace of duck from a reluctant Chinaman. After dinner Gamble turned on his gramophone — the radio is hardly a practicable proposition on the upper Irrawaddy — and we chatted till midnight, fortified by potent cocktails of rum and honey. Gamble had lost two of his mules the previous night. They had wandered a little too far off the road and had been taken by a huge tiger, as the pug-marks testified. He asked us to keep an eye open for the tiger, but though we followed his marks for a mile, we soon lost them in the jungle. Tigers abound here, but they are said never to return to a kill, which makes them difficult to shoot.

Next morning we went our ways, Gamble northwards, we southwards, out of each other's lives for ever. So passed our second Christmas on the road.

A few days later we reached 'Nsop, where, despite more rain and the churning up of the clay road, lorries were running to and from the railhead forty miles distant. Here we got into touch with Myitkyina by telegraph. Cranbrook shot a langur, a large grey ape with a long tail; but when the mules saw the corpse they went mad. It was impossible to put it on one of the loads, as every mule stampeded at the smell of blood. The Burma Game Rules apply on the Fort Hertz road, though probably nobody pays much attention to them. It is absolutely prohibited to shoot anything with poisoned arrows, and a licence is required for shooting certain of the rarer animals, such as rhinoceros and withan. The prohibition is a little late. It is almost certain that there are no longer any of these to shoot. There is a close season for every animal, and some birds are absolutely protected, jays, minivets, hornbills, woodpeckers, king-crows, barbets, sunbirds and flowerpeckers among them. One cannot help wondering on what principle the selection is made: perhaps an aesthetic one. Near 'Nsop I picked up a badly injured and very frightened crow-pheasant which had just been dropped by an owl; but crow pheasants are not on the prohibited list.

On December 30th we reached Weshi, where the eastern and western branches of the Irrawaddy unite. We were on the edge of the great plain of Upper Burma. Then, on New Year's Day, 1931, we marched into Myitkyina. And so, just thirteen months after setting out on the Irrawaddy adventure, we were back amidst the pleasures and griefs of European civilization. The journey was over. But only the journey. Not the exploration. This would be continued, year after year, at the flowering of the rhododendrons, in many an English garden.

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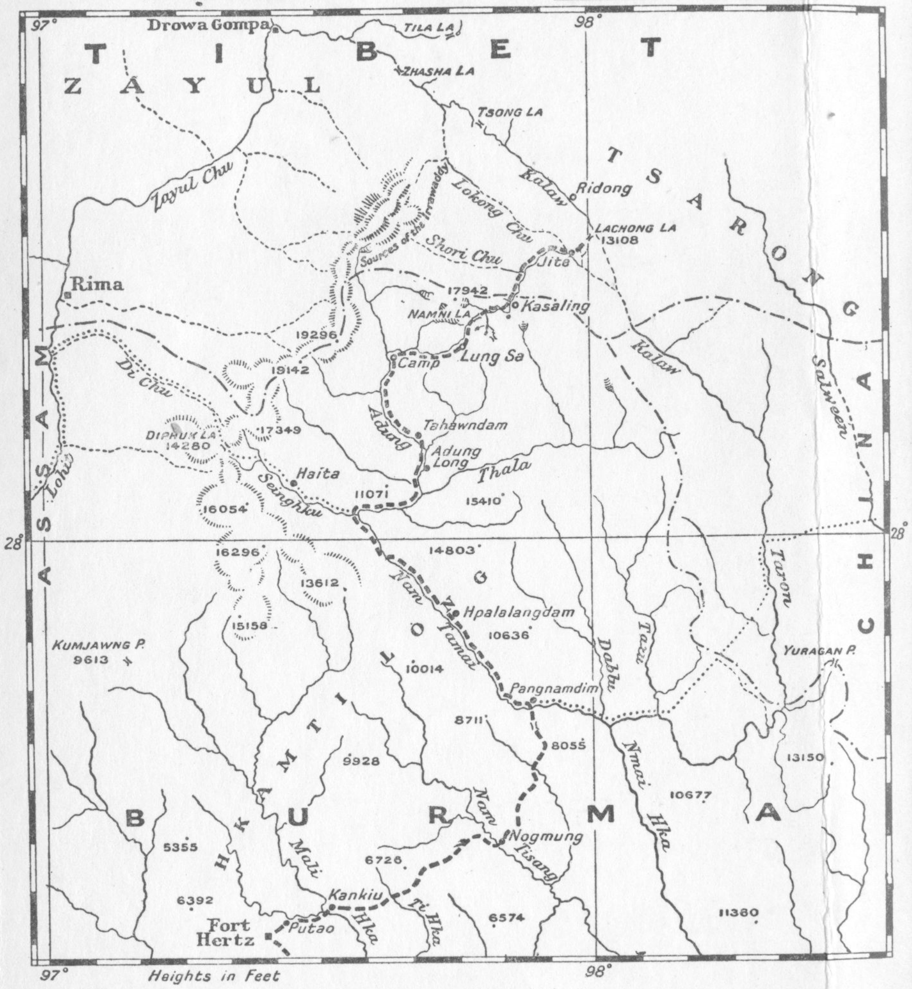
FAR NORTHERN BURMA AND THE SOURCES OF THE IRRAWADDY.



Author's Route 1930-31
" " 1922 & 1926
Scale of Miles
10 0 10 20
97°
98°
TIBET
ZAYUL
Drowa Gompa
TILA LA
ZHASHA LA
TSONG LA
Zayul Chu
Sources of the Irrawaddy
Lokong Chu
Kalaw
Ridong
TSARONG
LACHONG LA 13108
Shori Chu
Jite
17942
NAMNI LA
Kasaling
Rima
19296
19142
Camp
Lung Sa
Di Chu
Adung
Tahawndam
DIPHUK LA 14280
17349
Adung Long
Thala
Lohit
Haita
Seinghku
11071
15410
16054
ASSAM
28°
16296
14803
13612
Nam Tamai
Hpalalangdam
15158
10636
KUMJAWNG P. 9613
10014
Dablu
Taza
Taron
Salween
CHINA
YURAGAN P.
Pangnamdim
8711
8055
Nmai Hka
13150
9928
10677
HKAMTI LONG
BURMA
Nam Tisang
Nogmung
5355
Mali
6726
6392
Kankiu
Ti Hka
Fort Hertz
Putao
Hka
6574
11360
Heights in Feet

APPENDICES

APPENDIX I

STAGES, MYITKYINA TO JITÉ

Stage	*Miles*	*Transport*
0. Myitkyina	0	By car, lorry, or bullock cart. By boat from 'Nsop Zup to Myitkyina (down journey only). By bullock cart or mule transport in the dry season only. By bullock transport or coolies, during the rains.
1. Alam	12	
2. Chinkran Hka	21	
3. Weshi	33	
4. 'Nsop Zup	42	
5. Tiang Zup	55	
6. Supkaga	64	
7. Kadrangyang	75	
8. Kawapang	84	
9. Tingpai	95	
10. Mython Hka	107	
11. Wasat Hka	121	
(12). Sumpra Bum (District H.Q. off main road)	135	
12. Machega	128	By mule transport in the dry season. By bullock transport or coolies in the rainy season. Furnished bungalow at each stage from Myitkyina to Fort Hertz.
13. Hpungin Hka	138	
14. Hpunchan Hka	149	
15. Tutuga	160	
16. Lawanga	168	
17. Masum Zup	181	
18. Hkamho	194	
19. Nawunghkai	207	
20. Fort Hertz	220	Fort Hertz to Kankiu by river (dugout canoe).
21. Kankiu R.H.[1]	232	
22. Ti Hka R.H.	243	By coolies or mule transport
23. Camp in jungle	251	
24. Nogmung R.H. (Tisang River)	262	
25. Camp in jungle	270	
26. Camp in jungle	282	
27. Camp in jungle	291	

[1] R.H. = Rest Hut. Distances after Fort Hertz approximate.

28. Pangnamdim R.H. (Tamai river)	300	By coolies or mule transport.
29. Kamgoi R.H.	308	
30. Marit R.H.	317	
31. Hpalalangdam R.H.	327	
32. Hkawai R.H.	336	By coolies only.
33. Salawngdam R.H.	348	
34. Tazungdam R.H. (Seinghku confluence)	356	
35. Camp in jungle	363	
36. Camp in jungle	371	
37. Adung Long	376	
38. Tahawndam (Base Camp)	385	
39. Camp in jungle	390	
40. Camp in jungle	396	
41. Camp One (river confluence)	405	
42. Camp in forest	410	
43. Lung Sa camp	420	
44. Camp (after crossing Namni pass)	428	
45. Kasaling camp	433	
46. Camp in forest	442	Ponies and yak
47. Jité	450	

APPENDIX II

WEATHER

Sufficient instrumental and other observations were made to give a fair general idea of the climate in far northern Burma. Coupled with what has been said about the vegetation, which is an index of the climate, anyone visiting the Adung valley should know what to expect. Observations were not made regularly, but for most months while we were settled in camp there is a good series. Averages over a long period, no doubt, have their uses; but over a short period it is the extremes of temperature and rainfall which cause things to happen — landslides, the temporary migration of birds or mammals, the local abundance or otherwise of a certain species of plant. It is these extremes that I have tried to indicate.

Regular meteorological records are kept by government observers at Myitkyina, Sumpra Bum and Fort Hertz only. The following is a brief outline of the weather we experienced month by month. All temperatures are Fahrenheit.

December 1930. Myitkyina to Fort Hertz. Weather usually fine and sunny, but humidity high at night, with heavy mists in the valleys. Up to 3000 feet, at least, the temperature never falls to freezing-point. The average winter maximum (in shade) is 65-75°, rising in the hot weather to over 90°.

Lowest minimum recorded 41° (Fort Hertz, December 25th). Highest minimum 56°. Highest maximum 73°. Lowest maximum 66°.

Rain on three days. Annual rainfall over 150 in., mostly falling between April and October. For a few hours during the day, the humidity may sink so low as 40-50 per cent. It is generally much higher.

January 1931. Fort Hertz to Tahawndam. The farther we penetrated into the hills, the shorter the periods without rain, the higher the humidity, and of course, the lower the temperatures, especially the minimum.

Most of January (7th-31st) was spent in the Tamai valley at about 4000 feet altitude. Seven days were more or less wet, but there was abundant sunshine the rest of the time.

Lowest and highest minimum temperature recorded 41° and 50°. Highest and lowest maximum temperature 75° and 50°.

There are not such heavy winter mists as in the Mali Hka valley. Humidity often over 80 per cent, sometimes reaching 94 per cent. It never falls below 50 or 60 per cent except possibly for an hour or two on fine, hot days when a breeze is blowing.

January is a cool, temperate month even in an enclosed valley like the Tamai; but the temperature gradient rises very steeply after February, the maximum attaining over 90° by May, a temperature never attained in England. Rainfall high, probably over 150in. a year, most of it falling between April and October.

February 1931. Tahawndam, Adung valley (upper Tamai valley), 6000 feet (February 7th-28th). Climate moist, cool-temperate, with hot, wet summers and several fine winter months. Rain at all seasons, but most of it falls between June and October. Humidity always high — no drought season. Snow seldom falls below 7000 feet and never lies long. Frost occasionally between November and March.

Lowest minimum temperature recorded 30° on the 14th; on four other days 32° (freezing point) was touched. On six days the minimum was 40° or over. Highest maximum temperature recorded 65° on the 24th; on four other days it was 60° or over, but on two days it only reached 49°. Probably the coldest month of the year, owing to the heavy accumulation of snow all round the valley.

There were twelve days without rain, but only rarely did twenty-four hours pass without *some* rain. On eleven days rain fell continuously. Snow one day. Humidity high, probably never falling much below 80 per cent, often 100 per cent. No mist.

March. Tahawndam, 6000 feet (except March 25th-31st at 'week end cottage', 8000 feet). Lowest and highest maximum recorded 30°-40°. Highest and lowest maximum recorded 76-45°. Range 46°. On twelve days the maximum exceeded 60°, and on six days it exceeded 70°. On fifteen days the minimum fell below 40° and on two days below 32° with hoar frost. On March 2nd we had snow. Rainy days twelve, including several no more than showery. Sunshine in moderate amount. Humidity high. Thus, after the middle of March, spring — a more genial spring than England enjoys — was definitely in, with temperatures of over 70° and no frost.

April. Tahawndam, 6000 feet. Lowest and highest minimum recorded 38° and 51°. Highest and lowest maximum recorded 80° and 52°. Range of 40°. Rainy days seventeen, showery rather than continuous rain. There was a moderate amount of sunshine, and on fine mornings the ground was wet with dew. Humidity high.

May. Tahawndam, 6000 feet (May 1st-12th); Camp One, 8000 feet (May 13th-31st). At Tahawndam, six fine sunny days, when it was like an English June. Maximum temperature recorded 78°, minimum 43°. The heavy dew showed how damp the air was. At Camp One, ten rainless days, half of them sunny; some showery days, but few days of continuous rain. Maximum temperature recorded 69°, minimum 44°. Though there were fifteen days with some rain, May was on the whole a fine month.

June. Camp One, 8000 feet (June 1st-7th); Lung Sa, 12,000 feet (June 8th-30th). The first seven days were fine and sunny with hardly any rain except under cover of darkness. Maximum temperature recorded 70°, minimum 49°. At Lung Sa, maximum 72°, minimum 35°. Seventeen rainy days out of twenty-four, but rain not continuous, and there was intermittent sunshine. Heavy dew on fine mornings, the air always moist. The snow absorbed much heat in melting.

July. Lung Sa, 12,000 feet (Alpine Burma). Highest and lowest maximum temperatures observed 75° and 55°. Lowest and highest minimum observed 39° and 48°. Much cooler than an English July.

The temperature was now much steadier, with a range of less than 40°. Rain every day, sometimes only local showers. Much less sunshine than in June. Atmosphere very humid; often heavy mist at night. Continuous as the rain is, the actual fall in the high alps is much less than it is at Tahawndam.

August. Lung Sa, 12,000 feet (Alpine Burma). Temperature was still very steady, but not so warm as an English August. Highest and lowest maximum observed 74° and 58°. Lowest and highest minimum 38° and 47°. Range less than 40°.

Very wet, but wetter by night than by day, with thick cloud in the valley after dark, the peaks often standing clear. Twenty-eight rainy days, but fourteen days were fine for half the day or more. Not much sunshine. Humidity high. Snow fell above 16,000 feet on one occasion.

September. Lung Sa to Jité and back. The wettest month of the year, with twenty-eight rainy days. Very little sunshine, the sky almost continuously overcast. Cool temperatures and high humidity. At Jité, maximum temperature recorded 70°, minimum 44°. After the middle of September the minimum began to fall steadily. Snow fell above 14,000 feet on several occasions.

October. Lung Sa. A fine month. Eighteen rainless days, abundant sunshine. The thirteen days with rain often only showery.

A considerable drop in the temperature, 31° being the minimum recorded several times, with white frost. The highest maximum recorded was 63°, but the average was only about 50°. The first snow fell at Lung Sa about the end of the month, and melted again early in November.

November. Tahawndam and the Tamai valley. A fine sunny month, perhaps the finest in the year. Twelve days, not consecutive, of almost continuous sunshine, out of twenty-nine days without rain. Dew, hoar frost and, in the Tamai valley, morning mists indicate a high degree of humidity. On most of the six wet days it only drizzled.

December. From the Nam Tamai to Fort Hertz and Myitkyina (Hill jungles of Burma).

As in 1930. Fine and warm. Heavy morning mists south of Fort Hertz. Christmas day wet and windy. But twenty-five rainless days and abundant sunshine.

APPENDIX III

ZOOLOGY

THE zoological specimens collected on the Upper Irrawaddy included mammals, birds, reptiles, amphibians and insects.

The mammals were worked out by Captain Guy Dollman, the birds by Mr. N. B. Kinnear, and the reptiles and amphibians by Dr. Malcolm Smith, all of the Natural History Museum. To these gentlemen I am indebted for the naming of the specimens; and to them and to Lord Cranbrook for most of the information given here.

1. MAMMALS. The mammals numbered about forty-five species, several belonging to very rare genera. At least four species are new to science. We collected two species of monkey, a grey langur (*Pithecus shortridgei*), not uncommon in the forests north of Fort Hertz, where it goes about in large bands, and the pig-tailed baboon (*Macaca nemestrina*), also common. We saw and frequently heard hoolocks or gibbons (*Hylobates hoolock*); but this monkey is rare in the Tamai valley and does not extend north of the Seinghku confluence. The only monkey we saw in the Adung valley was the pig-tailed baboon.

The ungulates seen were the Chinese muntjac, or barking deer as it is called in India (*Cervulus muntjac*); serow (*Capricornis sumatrensis*) and a new species of goral, described as *Cemas Cranbrookii* after my companion Lord Cranbrook. This last is found at much higher elevations than most gorals, and I have seen specimens, presumably of this species, in Assam at 12,000 feet and in far northern Burma so high as 13,000-14,000 feet. It is confined to the high, forested mountains of the North-East Frontier of India (Assam—Burma—Tibet) within the monsoon area.

Four species of bats, belonging to several genera, were obtained. Bats were common at Tahawndam, but we saw none farther north at the higher elevations. One is a new species of Myotis.

Other insectivora collected were the Chinese tree-shrew (*Tupaia belangeri*); three genera of moles, namely Rarascaptor, Scaptonyx, and Rhynchonax, the species represented including *Scaptonyx fusicaudata* and *Rhynchonax Andersoni*, both very rare; two giant water-shrews

(*Nectogale sikkimensis* and *Chimarrogale styani*), also rare; and several true shrews, including the very rare *Blarinella Wardii*, and the long-tailed *Soriculus irene*.

Although we ourselves saw no cats, we obtained two skins of the golden cat (*Profelis temmincki*); a Linsang or tiger-civet (*Linsang pardicolor*), the skin of which was obtained at Jité, in Tibet, though it might have come originally from Burma; a leopard-cat (*Prionailurus bengalensis*); two Himalayan palm-civets or tree cats (*Paguma Grayi*); a marten (*Charronia flavigula*); a lesser panda (*Aelurus fulgens*); and two species of weasel, *Mustela sibirica* and another.

Other carnivores known to inhabit the upper Irrawaddy forests are wild dogs and Himalayan bear. We did not hear of tiger or leopard north of Fort Hertz, nor did we see any skins; but it is probable they are found in the warm Tamai valley.

Of rodents we secured many species, belonging to about sixteen genera. Two species of flying squirrel (*Petaurista yunnanensis* and *Hylopetes alboniger*), several bandicoot-rats (*Nesocia*), giant squirrels (*Ratufa gigantea*), striped squirrels (*Tamiops*), long-nosed squirrels (*Dremomys pernyi* and *D. Macmillani*) and red-bellied squirrels (*Callosciurus erythroeus*) were collected. The red-bellied squirrel vary somewhat in coloration, and Cranbrook obtained a fine series of them.

Two specimens of the genus Tomeutes represent a new species, not yet described.

The other Rodentia include rats, mice and voles. There are six species of Rattus, one new; other genera include Apodemus and Microtus.

The mammal fauna of the upper Irrawaddy numbers perhaps sixty or seventy species, some of which are extremely rare. We failed to procure some known species and possibly some unknown ones. Anyone with more time at his disposal could make a fine collection by going farther afield than the Tamai valley, up some of its tributaries, for example. The natives can easily be persuaded to bring specimens and probably trained to skin them.

2. Birds. Ninety-two species of birds were collected. The avifauna of the upper Irrawaddy probably numbers three or four times as many. About a dozen species are new to Burma, but we discovered no new species.

The collection as a whole confirms the general relationship between the Eastern Himalayan and South-Western Chinese sub-regions.

For the following list I am indebted to Mr. N. B. Kinnear, Assistant Keeper, Natural History Museum, who has published a full account in the *Journal of the Bombay Natural History Society* for August 15th, 1934.

List of Birds Collected by Lord Cranbrook

The numbers are those on the labels attached to the specimens. For a full account of the collection, see 'On the Birds of the Adung Valley, North-East Burma', by N. B. Kinnear, *Journal of the Bombay Natural History Society*, Vol. xxxvii, No. 2, 1934.

156. Corvus macrorhynchos macrorhynchos. Jungle Crow.

117. Urocissa erythrorhyncha erythrorhyncha. Chinese Red-billed Magpie.

6. Cissa chinensis chinensis. Green Magpie.

112. Garrulus bispecularis chinensis. Chinese Jay.

110. Nucifraga caryocactes yunnanensis. Yunnan Nutcracker.

32. 79. 105. Parus monticolus yunnanensis. Yunnan Green-backed Tit.

159. Lophophanes ater aemodius. Himalayan Cole-Tit.

139. Lophophanes rufonuchalis Beavani. Sikkim Black-Tit.

26. Aegathaliscus bonvaloti. Chinese Black-headed Tit.

22. Sitta europaea nebulosa. Nuthatch.

98. Dryonastes caerulatus kaurensis. Kachin Hills Laughing Thrush.

23. Trochalopterum erythrocephalum Forrestii. Forrest's Laughing Thrush.

45. 48. 115. 121. 122. Trochalopterum affine Oustaleti. Oustalet's Laughing Thrush.

124. 125. Trochalopterum subunicolor griseata. Yunnan Plain-coloured Laughing Thrush.

7. 90. 99. 113. Grammatoptila striata Cranbrooki. Cranbrook's Laughing Thrush.

25. 47. Fulvetta vincipectus bieti. Yunnan Fulvetta.

8. 24. 37. 58. Leioptila pulchella caeruleotincta. Yunnan Beautiful Sibia.

71. 85. Actinodura nipalensis Wardi. Ward's Bar-wing.

64. Yuhina gularis gularis. Yunnan Yuhina.

15. Ixulus flavicollis rouxi. Chestnut-naped Ixulus.

76. Leiothrix lutea yunnanensis. Yunnan Red-billed Leiothrix.

33. Pteruthius aenobarbis melanotis. Chestnut-headed Shrike-Babbler.

73. Myzornis pyrrhoura. Fire-tailed Myzornis.

77. 78. Microseelis leucocephalus leucocephalus. Chinese Black Bulbul.

103. Ixos macclellandi similis. Yunnan Bulbul.

36. 104. Pycnonotus aurigaster xanthorrous. Anderson's Yellow-vented Bulbul.

130. Certhia familiaris khamensis. Tibetan Tree-Creeper.

56. Troglodytes troglodytes talifuensis. Yunnan Wren.

111. Oligura castaneo-coronata. Chestnut-headed Wren.

44. 89. Cinclus pallasi marila. Formosan Brown Dipper.

92. Rhodhophila ferrea Haringtoni. Eastern Dark-grey Bush-Chat.

38. Microcichla scouleri scouleri. Little Forktail.

20. 49. Phoenicurus frontalis. Blue-throated Redstart.

29. 66. Rhyacornis fuliginosa fuliginosa. Plumbeous Redstart.

10. 146. Chaimarrornis leucocephalus. White-capped Redstart.

16. 17. Grandala caelicolor florentes. Chinese Grandala.

135. 140. Calliope tschebaiewi. Tibet Ruby-Throat.

144. Tarsiger chrysaeus chrysaeus. Golden Bush-Robin.

50. 158. Ianthia cyanura rufiliata. Red-flanked Bush-Robin.

55. 63. 68. Turdus atrogularis. Black-throated Thrush.

57. Turdus ruficollis. Red-throated Thrush.

150. Oreocincia dixoni. Long-tailed Mountain Thrush.

157. Myiophoneus temmincki eugeniae. Burmese Whistling Thrush.

14. 42. 70. Prunella collaris Ripponi. Rippon's Accentor.

46. 59. Prunella strophiata multistriata. David's Accentor.

12. 34. Prunella immaculata. Maroon-backed Accentor.

148. Hemichelidon sibirica Rothschildi. Yunnan Sooty Flycatcher.

83. Siphia strophiata strophiata. Orange-gorgeted Fly-catcher.

97. Muscicapula sapphira. Sapphire-headed Fly-catcher.

81. 88. Eumyias thalassina thalassina. Verditer Fly-catcher.

102. Culicicapa ceylonensis ceylonensis. Grey-headed Flycatcher.

127. 132. Chelidorhynx hypoxantha. Yellow-bellied Fly-catcher.

109. Pericrocotus brevirostris affinis. Assam Short-billed Minivet.

9. Pericrocotus solaris solaris. Yellow-throated Minnivet.

95. Dicrurus leucophaeus Hopwoodi. Assam Grey Drongo.

134. Tribura thoracica thoracica. Spotted Bush-Warbler.

136. Phylloscopus pulcher pulcher. Nepal Orange-barred Willow-Warbler.

120. Phylloscopus magnirostris. Large-billed Willow-Warbler.

84. 149. Phylloscopus inornatus inornatus. Crowned Willow-Warbler.

54. Abroscopus schisticeps Ripponi. Sharp's Fly-catcher Warbler.

133. Perissospiza icteroides affinis. Allied Grosbeak.

151. 151a. Perissospiza carnipes carnipes. White-winged Grosbeak.

123. 138. Pyrrhula erythaca. Beavan's Bullfinch.

93. 94. Pyrrhula nepalensis Ricketti. Rickett's Bullfinch.

106. Carpodacus erythrinus roseatus. Common Indian Rose-Finch.

51. 52. 53. Spinus tibetanus. Tibetan Siskin.

60. 61. 62. Passer rutilans intensior. Yunnan Cinnamon Sparrow.

30. 31. 43. Fringillauda nemoricola nemoricola. Hodgson's Mountain Finch.

19. 40. Emberiza pusilla. Little Bunting.

67. Motacilla alba leucopis. White-faced Wagtail.

96. Motacilla cinerea caspica. Eastern Grey Wagtail.

100. 101. Motacilla citreola calcarata. Hodgson's Yellow-headed Wagtail.

13. 27. 28. Anthus Hodgsoni. Indian Tree Pipit.

128. 147. Anthus roseatus. Hodgson's Pipit.

129. Aethopyga ignicauda exultans. Yunnan Fire-tailed Sunbird.

72. 91. Aethopyga Dabryii. Dabry's Sunbird.

11. 18. 35. 69. Aethopyga nipalensis nipalensis. Nepal Yellow-backed Sunbird.

108. 116. 119. 155. Hypopicus hyperythrus sikkimensis. Eastern Rufous-bellied Woodpecker.

21. Dryobates cathpharius tenebrosus.

114. Dryobates darjellensis. Darjeeling Pied Woodpecker.

2. Sasia ochracea ochracea. Indian Rufous Piculet.

107. Cuculus poliocephalus poliocephalus. Small Cuckoo.

87. Upupa epops longirostris. Burmese Hoopoe.

5. Pyrotrogon erythrocephalus erythrocephalus. Red-headed Trogon.

65. Collocalia brevirostris pellos. Szechwan Swiftlet.
160. Glaucidium cuculoides rufescens. Burmese Barred Owlet.
3. Ducula badia griseicapilla. Grey-headed Imperial Pigeon.
131. 141. 142. Columba leuconota gradaria. Eastern Snow Pigeon.
4. Gennaeus horsfieldi horsfieldi. Black-breasted Kalij.
153. 154. Lophophorus Sclateri. Sclater's Monal.
82. Tragopan Temmincki. Temminck's Tragopan.
74. 126. 142. 146. Ithaginis cruentus Kuseri. Yunnan Blood-Pheasant.
1. Tringa hypoleucos. Common Sandpiper.
80. Phalacrocorax carbo sinensis. Chinese Cormorant.
39. Anas crecca crecca. Common Teal.

3. Reptiles and Amphibians. Like the birds, the reptiles and amphibians are of intermediate Himalayan and Chinese affinity, according to Dr. Malcolm Smith. *Natrix nuchalis* and *Elaphe mandarina*, two Southern Chinese snakes, were obtained, thus extending their distribution westwards. On the other hand a Himalayan Pit Viper (*Trimeresurus Jerdoni*) was collected farther east than its known habitat.

Other Himalayan species are an Indian tree-frog, *Rhacophorus maximus*, and the toad *Scutiger sikkimensis*, both collected farther east than they were previously thought to extend.

The only lizard found, *Calotes Wardii*, has been described by Malcolm Smith as new.

4. Insects. Mr. K. G. Blair, of the Natural History Museum, has kindly given me a few notes.

Butterflies. Mr. N. D. Riley reports that those obtained are all eastern Palaearctic species, known from Western China. They show no affinities with Oriental species.

Tipulidae. Many new species of 'daddy-long-legs' were obtained. According to Dr. F. W. Edwards, they are related some to western Chinese, others to European forms. They show no affinities with Oriental species. Dr. O. W. Richards says that the bumble-bees, of which we collected a fair number, are related to Himalayan species.

APPENDIX IV

PLANTS INTRODUCED FROM FAR NORTHERN BURMA

The following trees, shrubs, and alpines are in cultivation from seed collected by me in 1926 (Seinghku Valley) and 1931 (Adung valley). Many of them have flowered and are to be seen in gardens thrown open to the public. Not all the seed plants collected are mentioned; this applies especially to rhododendron, only fifty of the more interesting species, out of about a hundred species found, being included. Nor have I thought it necessary to give a complete list of all the herbarium specimens collected, some of which are still unidentified. Many of these are mentioned in the text. They can be seen at the Natural History Museum, London.

For most of the identifications I am indebted to the following: To Dr. J. Hutchinson, Mr. C. E. C. Fischer, Mr. C. B. V. Marquand and Mr. H. K. Hirey Shaw, of the Royal Botanic Gardens, Kew; to Sir William Wright-Smith and the late Mr. H. F. Tagg, of the Royal Botanic Gardens, Edinburgh; and to Mr. A. B. Jackson and Dr. G. Taylor, of the Natural History Museum. Royal Horticulural Society Awards are indicated thus: A.M.: Award of Merit. F.C.C.: First Class Certificate.

K.W. No.	
7634	Abies sp.
7256	Acer sikkimense
9218	„ Hookeri
9511	„ Campbellii var. yunnanensis vd.aff.
9595	„ erosum
10083	„ tetramerum
10091	„ caesium
10174	„
10190	„ niveum
9950	Aconitum Dielsianum
9952	„ Hookeri
10102	„
10119	„ Souliei
K.W. No.	
12227	Ajuga ovalifolia
10026	Allium
10065	Aquilegia
9645	Anemone obtusiloba
9580	Arisaema
9700	Aster
9825	„
9828	„
9871	„ himalaicus
9895	„
9934	„
10025	„ fuscescens. Bur. et Franch
10145	„

K.W. No.	
6768	Begonia
7432	,,
9418	,,
6787	Berberis hypokerina, Shaw ('Silver Barberry'). A.M. 1932 (as B. Hookeri, var. glauca, corrected 1935)
6969	,, concinna
9324	,, Hookeri
9358	,, insignis, Hook f. var.
10008	,, sp. nov.?
7637	Betula
10154	Buddleia
10181	Bulbophyllum leopardinum
9362	Celastrus Loeseneri, Rehder et Wilson
7607	Clematis urophylla, Franch.
6803	,, napaulensis, D.C.
6883	,, vitifolia, Wall.
7615	,, biternifolia, Shaw
9182	,, acuminata
9209	,, Henryi
9836	Corydalis sp.
9837	,, ,,
9613	Cotoneaster vulgaris
6788	,,
7086	,, microphylla
9807	,,
9571	Clethra Fargesii
10149	Craibiodendron Henryi

K.W. No.	
9926	Cremanthodium variifolium
9891	Cyananthus lobatus Wardii
9924	,, incanus
9070	Cypripedium (Paphiopedilum) Wardii
9819	Delphinium
10030	,,
12368	Dicranostigma lactucoides
9246	Disporum
11841	Dracocephalum Hemsleyanum
12376	,, tanguticum
10132	Enkianthus pauciflorus
10118	Epilobium
9098	Eriobotrya dubia
9093	Euonymus Rehderiana
9216	,, oblongifolia
9376	,, ,,
10152	,, ,,
9327	,,
9592	,, cornuta
10124	,, ,,
9760	Euphorbia Stracheyi
9985	,, pilosa
6845	Gaultheria thibetica
7134	,, Wardii. A.M. 1932
9091	,, discolor
9305	,, fragrantissima
9639	,, sp.nov. trichophylla group
9885	,, sp. aff. trichophylla
9909	,, trichophylla

K.W. No.	
10130	Gaultheria sp. nov. trichophylla group
9847	Gentiana phyllocalyx
9865	,, filistyla
9927	,, otophora var. ovato-sepala
10000	,, gilvostriata, Marquand. A.M. 1935
10004	,, sikkimensis
10101	,, Veitchiorum, var. coelestis
9771	Geranium Donianum
7224	Hypericum
9143	Ilex corallina
9212	,, sp. aff. corallina
9242	,, Wilsoni
9253	,, sikkimensis var. coccinea
9256	,, sp. aff. yunnanensis
9587	,, ,, ,, ,,
9331	,, Hookeri
9372	,,
9624	,, intricata vd. aff.
9626	,, yunnanensis
7063	Iris
9357	,, Wattii
9474	,,
9712	,,
9302	Leucothoe Griffithiana
6946	Lonicera
7113	,, Webbiana
7118	,, tomentella var. tsarongensis
7510	,,
7539	,, hispida
7745	Manglietia insignis

K.W. No.	
11821	Meconopsis bella
6862	,, betonicifolia Franch. var. pratensis ('Blue Poppy'). A.M. 1935
12409	,, sinuata
7207	,, violacea
7006	Nemocharis
7030	,,
7049	,, nana, var.
9686	,, ,, ,,
9551	,, pardanthina (fine form)
9661	,, Souliei
10014	,, ,,
9923	Notholirion campanulatum
6821	Omphalogramma Souliei. A.M. 1929
9698	,, ,, ,,
10032	Parnassia
9276	Photinia Notoniana
9133	Pleione
6822	Primula eucyclia, W. W. Sm. et Forrest. A.M. 1930
6975	,, concholoba, Stapf et Sealy
6981	,, cyanantha, Balf. f. et Forrest.
10090	,, ,, ,,
7054	,, sikkimensis, Hook f.
7226	,, capitata
9494	,, sino-Listeri var.

K.W. No.	
10040	Primula lichiangensis
9314	Prunus Puddum ('Carmine Cherry')
9604	,, rufa
9315	Pyrus ('Goldbeam')
9525	,, malus omtrophila
9801	Pyrola rotundifolia, var. asarifolia
7101	Rheum palmatum ('GiantRhubarb')
9729	,, acuminatum
6753	Rhododendron sidereum
6782	,, sino-grande
9385	,, ,,
6793	,, seinghkuense
9543	,, ,,
6794	,, tephropeplum
9565	,, ,,
6795	,, Martinianum
7612	,, ,,
6805	,, chaetomallum
9637	,, ,,
6809	,, Taggianum
9220	,, ,,
6818	,, arizelum
9397	,, ,,
6833	,, hylaeum
9322	,, ,,
6854	,, euchaites
6855	,, exasperatum
6856	,, vesiculiferum
9726	,, ,,
6868	,, telopeum
6869	,, eclecteum
10159	,, ,,
6884	,, imperator. A.M. 1934

K.W. No.	
6903	Rhododendron riparium. A.M. 1930
9633	,, ,,
6923	,, cerasinum
6924	,, pruniflorum
9735	,, ,,
6960	,, luridum
7048	,, ,,
6961	,, pumilum
6962	,, myiagrum
6967	,, crebreflorum. A.M. 1934
9591	,, ,,
6984	,, calciphila
9717	,, ,,
6991	,, horaeum
7058	,, paludosum
7108	,, brevistylum. A.M. 1933
7122	,, niphargum
9479	,, ,,
7124	,, sperabile
7139	,, megacalyx
9261	,, ,,
7184	,, recurvoides
7189	,, rhaibocarpum
7190	,, setiferum
7426	,, tanastylum
9236	,, ,,
7427	,, protistum
7455	,, chrysolepis
7630	,, notatum
9200	,, magnificum
9301	,, ,,
9221	,, chrysodoron
9371	,, ,,
9275	,, stenaulum

K.W. No.	
9383	Rhododendron cerasiflorum
10140	,, ,,
9415	,, Genestierianum
9490	,, ,,
9500	,, selense
9505	,, timeteum
9509	,, ,,
9609	,, chryseum (yellow)
8710	,, ,, (purple)
9636	,, ,, (nat.hybrid)
9810	,, rubriflorum
10136	,, rubrantherum
10175	,, taronense
10180	,, dendricola
7244	Rosa sp.
7501	,, ,,
10011	Rubus Fockiana

K.W. No.	
9589	Salix Lindleyana
9840	Saxifraga diversifolia
10171	Sarcocca pruniformis
10126	Schima khasiana
9724	Sedum sp.
6851	Sorbus Harroviana
9653	,, microphylla
9663	,, foliolosa
9726	,, microphylla vd. aff.
10015	Syringa
9797	Thalictrum adiantifolium
10031	Trollius yunnanensis
6796	Vaccinium glauco-album
9662	,, modestum
9198	Viburnum atrocyanum
9223	,, stellulatum